Monitoring Outdoor Recreation in the Nordic and Baltic Countries

Liisa Kajala (editor)

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Nordic Environmental Co-operation

The Nordic Environmental Action Plan 2005-2008 forms the framework for the Nordic countries' environmental co-operation both within the Nordic region and in relation to the adjacent areas, the Arctic, the EU and other international forums. The programme aims for results that will consolidate the position of the Nordic region as the leader in the environmental field. One of the overall goals is to create a healthier living environment for the Nordic people.

Nordic co-operation

Nordic co-operation, one of the oldest and most wide-ranging regional partnerships in the world, involves Denmark, Finland, Iceland, Norway, Sweden, the Faroe Islands, Greenland and Åland. Co-operation reinforces the sense of Nordic community while respecting national differences and similarities, makes it possible to uphold Nordic interests in the world at large and promotes positive relations between neighbouring peoples.

Co-operation was formalised in 1952 when the Nordic Council was set up as a forum for parliamentarians and governments. The Helsinki Treaty of 1962 has formed the framework for Nordic partnership ever since. The Nordic Council of Ministers was set up in 1971 as the formal forum for co-operation between the governments of the Nordic countries and the political leadership of the autonomous areas, i.e. the Faroe Islands, Greenland and Åland.
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Summary

The aim of the project was to develop visitor monitoring methodologies for Nordic and Baltic land management agencies, the work of which is related to visitor management in protected and recreational areas. The main activity of the project was to create a basis for further development of visitor monitoring methodologies in protected and recreational areas.

The project’s activities have included exchanging experiences among participating countries, collecting material and case studies, translating relevant parts of the two existing Finnish manuals on visitor monitoring, and compiling a final report on the basis of all this working material. Among other sources of information, the project has built on ideas developed in the “Nordic-Baltic Workshop on Visitor Information Needs and Monitoring Methods”, arranged in June 2004 in Rovaniemi, Finland.

Through case studies and other exchange of experiences, it has been found out that there are certain common variables important to all the Nordic and Baltic countries that could be standardized. Therefore, the group will continue its work in 2006 in order to produce recommendations for a common visitor monitoring methodology in protected and recreational areas in the Nordic and Baltic Countries. These recommendations will be published in the form of a Nordic-Baltic manual on visitor monitoring practices.

This project has been made possible through funding from the Nordic Council of Ministers and the Swedish Environmental Protection Agency.
1. Introduction

The popularity of nature tourism and outdoor recreation is undergoing a constant increase in the Nordic countries. Information on visitors is essential for managing outdoor recreation in such a way as to promote sustainable tourism, public health and well-being, as well as the efficient protection of nature and cultural heritage, which are some of the goals of the Nordic Environmental Action Plan 2005–2008 as well. On the other hand, uncontrollably increasing the use of conservation areas can lead to trampling and other disturbances in the terrain, overcrowding, and endangering of ecological and cultural values. Several of the Nordic and Baltic countries are encountering similar challenges and problems related to nature tourism and outdoor recreation.

Efficient and harmonized monitoring methods and practices can contribute to efficient visitor management and administration of protected and recreational areas. Moreover, information on the number of visits as well as types of visitors is of great significance in enhancing sustainable tourism, as reliable data on the number of visits as well as visitor characteristics is a prerequisite for estimating sustainability. For example, the key figures for most of the impacts of nature and culture tourism are calculated in proportion to the number of visits to the area: e.g. amount of waste, consumption of firewood, wear on the terrain, various costs, or impacts of nature and culture tourism on the regional economy and culture.

In the Nordic and Baltic countries, an important principle of the recreational use of natural areas is the right of public access, also called Everyman’s right, or the traditional right of common access (Nordisk Ministerråd 1997). It has many consequences for visitor management regardless of land ownership and protection status. The monitoring of use is a special challenge when the areas have no entrance fee system, and areas have open access on all boundaries. In order to produce reliable and comparable information on visitation, it is useful to develop uniform counting and survey methods together. The network of researchers and practitioners in this field offers a forum for starting this kind of development.

Visitor surveys and counting methods have been developed in several countries besides the Nordic and Baltic countries, particularly in the United States, Canada and the United Kingdom. However, the Nordic and Baltic circumstances are rather different compared to these countries, and the know-how of the methodology is not directly transferable to Nordic and Baltic countries. One of the main differences between these countries
is the traditional right of common access that has a long tradition in the Nordic countries.

There are several reasons why currently protected and recreation area use is not assessed adequately in most countries. These include difficulties in quantifying and measuring, little or no coordination across areas nationally not to mention internationally, lack of quantitative and practical skills, and lack of decision-making and judgement skills (Watson et al. 2000).

The aim of the project was to develop visitor monitoring methodologies for Nordic and Baltic land management agencies, which work is related to visitor management in protected and recreational areas. The main activity of the project was to create a basis for further development of visitor monitoring methodologies in protected and recreational areas.

There are two main kinds of approaches in this context: on-site monitoring of visitors (surveying and counting of visitors to a specific area), and general population surveys (studying individuals or households at their home). The former includes all the visitors to the area, also foreign tourists. On the other hand, the latter can also include people who do not visit the nature areas under study. In some cases, the population surveys do focus on a particular nature area. All these approaches are needed and are complementary to each other, but they serve different functions and utilize different methodology.

The on-site monitoring of visitors is needed to provide information on visitors and their interaction with a particular nature area. Furthermore, visitor monitoring can provide information related to visitor encounters and social conflicts. One reason why it is particularly important to develop and standardize on-site visitor monitoring methodology is that area managers are the ones who implement these. In order to have quality results, managers need uniform information and instructions on how to implement visitor monitoring in practice. General population surveys are usually conducted by research agencies, often at a national level, and thus do not require as much and as detailed instructions since they already have established research protocol. However, even in the case of general population surveys there is a need for international development of methodology and standardisation.

This project focuses on actual users of the area, and especially on on-site visitor monitoring methods instead of on general population surveys. Moreover, the project considers a whole spectrum of areas all the way from protected areas to recreation areas, from remote backcountry areas to urban areas.

The target group of the outcomes of this project are the managers and staff of national parks, other established protected and recreation areas, as well as informal recreation sites. The results of this project can also be useful for the national administration, politicians and non-governmental organisations which need information for decision making. The project
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1.1 Project Participants

In the core group of the project, there has been one scientist and one park manager from each Nordic and Baltic country, except Latvia. However, depending on each country’s own judgement, some countries had just one representative in the project. The participants and their e-mail addresses were as follows:

- **Denmark**:
  - Frank Søndergaard Jensen, Center for Skov, Landskab og Planlægning, KVL (Danish Centre for Forest, Landscape and Planning, KVL), fsj@kvl.dk
  - Hans Skov-Petersen, Center for Skov, Landskab og Planlægning, KVL (Danish Centre for Forest, Landscape and Planning, KVL), hsp@kvl.dk
- **Estonia**:
  - Anu Almik, Riigimetsa Majandamise Keskus, RMK (Estonian State Forest Management Centre), anu.almik@rmk.ee
  - Kalle Karoles, Metsakaitse- ja Metsauuenduskeskus (Ministry of Environment, Centre of Forest Protection and Silviculture), kalle.karoles@metsad.ee
- **Finland**:
  - Tuija Sievänen, Metsäntutkimuslaitos (The Finnish Forest Research Institute), tuija.sievanen@metla.fi
  - Joel Erkkonen, Metsähallitus (The Finnish Forest and Park Service), joel.erkkonen@metsa.fi
  - Liisa Kajala, Metsähallitus (The Finnish Forest and Park Service), liisa.kajala@metsa.fi, project manager
- **Iceland**:
  - Gudridur Thorvardardottir, UST Umhverfisstofnun (Environment and Food Agency of Iceland), gurry@ust.is
- **Lithuania**:
  - Lina Diksaite, Kursiu Nerija National Park, l.diksaite@nerija.lt
  - Ausrino Armaitiene, Klaipeda University, Tourism and Recreation Department, ausrine@gmf.ku.lt

The objective is closely related to regional development, including the countryside and cultural environment, because recreational areas and protected land are often found in cultural environments in all the Nordic and Baltic countries.
• Norway:
  o Odd Inge Vistad, Norsk Institut for Naturforskning, NINA (Norwegian Institute for Nature Research), oddinge.vistad@nina.no
  o Reidar Dahl, Direktoratet for naturforvaltning (Directorate for Nature Management), reidar.dahl@dirnat.no
• Sweden:
  o Per Wallsten, Naturvårdsverket (Swedish Environmental Protection Agency), per.wallsten@naturvardsverket.se
  o Peter Fredman, Mid-Sweden University/Etour, peter.fredman@etour.se
  o Anna Fritiofson Naturvårdsverket, anna.fritiofson@naturvardsverket.se
2. Reasons for carrying out visitor monitoring

2.1 Why measure outdoor recreational use?

All management is dependent on knowledge and information. Moreover, the better the quality of information, the better the opportunity for good management. Consequently, information on visitors to protected and recreational areas is important, since visitors have political, economic, social and ecological impacts. All managers need quantitative data on how visitation impacts the park or protected area. The national administration, politicians and non-governmental organisations also need information for decision making. (Hornback & Eagles 1999)

To provide quality recreation opportunities, land managers must know their customers, i.e. visitors. Managers need to know at minimum how many people use the areas, when, and in what activities people participate. This helps balance supply and demand for recreation with other resources, and enables managers to provide what people desire. For ecological data, we want reliability and accuracy. The same requirements apply to visitor use data.

The main reason for visitor monitoring is the need to have comparable and reliable visitor information from different types of area, and in the long run we need to know the trends as regards the number of visitors. Besides being very important for the land managers, the reliable estimates are also of regional, national, and international significance.

From the standpoint of the conservation or recreation area's manager, it is important to know the basis on which visitors choose to visit a particular area, and what makes that area attractive. How does management of the area affect its attractiveness? What expectations do visitors have with regard to the quantity and quality of the services, and how well do the services satisfy the visitors' needs? How does a recreation area best produce benefits for the individual and society?

A good quality recreation environment eventually benefits the tourism industry, too. Consequently, if the aim of the tourism industry is to increase the number of tourists to a certain extent, it is important to monitor what kinds of impacts that increase is having on the recreation environment. Information on how the amount and type of visits are developing constitutes important data permitting this kind of impact to be estimated.

Visitor monitoring is not only a management tool, it is about building strategic knowledge on visitors – who they are, what they do, what they
want – enabling the development of sustainable tourism and the strengthening of regional development.

A good visitor monitoring programme consists of visitor surveys and visitor counting, because knowledge on both the numbers of visitors and their characteristics is important in planning and management processes. In fact, visitor counts and visitor surveys are complementary to each other and they should be carried out simultaneously (Erkkonen & Sievänen 2001). When estimating the scope and level of effort put into the visitor monitoring programme, we should remember that it should be in proportion to the requirement of area managers to provide data for general management, natural resource protection, maintenance operations and protection (Hornback & Eagles 1999).

2.2 How to use visitor information?

Visitor information is needed and useful at various levels from local to international, from planning to management in, for example:

- **management**
  - land use management planning
  - visitor management, e.g. to manage conflicts
  - providing satisfactory experiences for visitors
  - allocation of resources
  - estimating impacts on regional economy
  - comparisons between areas or locations
  - balancing between supply and demand

- **natural resource protection**
  - monitoring changes
  - monitoring impacts and estimating sustainability of nature tourism

- **maintenance operations**
  - planning of operations in protected or recreation areas
  - planning of operations at Visitor Centres and Customer Service Points

- **visitor services and protection**
  - e.g. environmental interpretation material
  - estimating recreation demand
  - infrastructure
  - safety

- **promotion of tourism development potential**
  - developing nature tourism entrepreneurships
  - improving marketing

- **monitoring, reporting and statistics**
  - indicators
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- e.g. annual national and international reports
- fulfilling legislative mandates
- marketing and communications
- research cooperation
- teaching and training
- information for establishing new areas, including urban forests.

A number of the items listed above are further elaborated in the following chapters modified from the translated text of Erkkonen & Sievänen 2001.

2.2.1 Planning of management and use

In the drafting of management-and-use plans, the visitor monitoring is one of a number of basic studies made in the initial phase of the process. The visitor survey and assessment of the numbers of visits produce basic data of the foremost importance – information with which the managers can get a grasp of the current situation, analyse problems, look for solutions, and, finally, establish objectives. However, the visitor survey by no means yields ready solutions to the eventual problems: at best, it supports planning and decision-making by referring to suitable solutions.

The visitor data help in perceiving and analysing problems, and in understanding the connections between whole entities and individual elements. The advantage of systematic data lies in their being comprehensive and susceptible to generalization. They thus afford a more justified picture of issues and phenomena than random observation and day-to-day experiences do.

A visitor survey is by nature a basic study that produces data for the solution of practical planning and management problems. Depending on the nature of the area, the decisions can vary a great deal: on the basis of a visitor survey, managers of national parks may decide upon measures very different from those taken at a municipal recreation area. At its best, a visitor survey supports decision-making in the planning of management and use, but does not actually direct that planning. Depending on the area, a visitor survey yields a large volume of such easily interpreted and adaptable information that will help directly in the placement, dimensioning, timing, and maintenance of services. This is all very important when aiming at a balance between supply and demand, providing what people desire.

Reliable estimates of the number of visitors and/or visits are extremely important for planning and managing the use of the areas in question. On the basis of such estimates, it is possible to gain a clearer picture of the use of the area and the sites where visitor traffic is heaviest. Information on visitor numbers helps the people responsible for managing the areas to control the flow of visitors, for example, by directing them to routes that cause less deterioration to vegetation and landscape and decrease the
sense of crowding. In addition, visitor counts also help to maintain and
develop services so that they better correspond to the real number of visi-
tors to the area (e.g. firewood supply and waste disposal). Furthermore,
reliable visitor statistics are needed, together with other information gath-
ered from visitor surveys, for evaluating the effectiveness of the area’s
own activities and for monitoring changes.

2.2.2 Targeting resources for the area’s maintenance and management

On the basis of visitor satisfaction data, one can target resources at the
improvement of a service with which visitors are dissatisfied. Here one
must first consider what are the satisfaction or dissatisfaction thresholds
upon reaching which measures are initiated.

Information on outdoor activities can be applied when a need exists to
guide the visitors in those pursuits, one way or the other, in the area. The
need may arise from congestion, conflicts between groups who pursue
different activities, or an overloading of the natural environment's carry-
ing capacity. By guiding usage, it is possible to attract visitors to such
activities as suit the area best from the standpoint of ecological and social
carrying capacity. Sometimes it may be necessary to direct resources to
support the prerequisites for a certain activity, or to shift those resources
from one activity to another.

Information on when and how people arrive at an area can, for exam-
ple, be utilized in planning work shifts for personnel at nature and infor-
mation centres, and in recruiting seasonal labour. From the perspective of
traffic arrangements, it is good to know when and by what type of vehicle
visitors come to the area. The arrival information can be utilized in plan-
ning parking places and directing traffic, for instance.

Identifying the geographic distribution of visits is useful in planning
services, trails, rest spots, and wood and waste management, among other
things. By directing visitor flows systematically, managers can also at-
tempt to avoid congestion and the deterioration of the terrain. In addition,
the number and geographic distribution of visitors can be used to justify
new investments to a project's financial backers, for example, and to di-
rect labour and other resources more effectively at different targets.

Information respecting the use of money by visitors can be utilized for
example in planning services subject to charges (various accommodation
and restaurant services), and in developing new services (new activities
and programme services). The money use patterns, when measured ade-
quately, provide information also for assessment of regional economic
impacts.
2.2.3 Marketing and communications

From the standpoint of marketing the area's services and the recreational possibilities the area offers, it is useful to have knowledge of the visitors' background information, and of where the visitors live. On the basis of the visitors' home communities, one can get an idea of whether the area is important in local, provincial, national or international terms.

Possible marketing efforts can be targeted more effectively when the visitors (or customers) are familiar in terms of their backgrounds and opinions. If managers wish to profile the area somehow, the visitor survey information will provide marketing tools. Through knowledge gained from visitor surveys, managers can do better at providing information about the services for the visitors.

2.2.4 Evaluating the impact of actions and monitoring changes

The usefulness of hiking and recreation services, like that of any other publicly funded activity, must be justified. In the management of an individual area, too, one can evaluate the benefits that follow from the activity and accrue to the society. The systematic and routine performance of visitor surveys at regular intervals makes it possible to monitor changes related to the area's recreational use. The uniform counting of visitors is also fundamentally related to the monitoring of changes.

The changes can affect both the structure of the area's body of visitors and their opinions (in terms of visitor satisfaction) of the area's pleasantness, or of the quality of services. Monitoring the changes helps to evaluate the impacts that changes made in the service structure, or the addition or termination of services, have had on visitor satisfaction. Monitoring also helps in assessing whether changes in management policy have led to clear changes in the structure of the body of visitors. For example, have former regular visitors disappeared and been replaced by new visitors? Or do the same people always visit the area, without there being any success in attracting new visitors?

2.2.5 Comparison of areas and estimating regional economic impacts

When similar measures, questions and indicators are applied to the monitoring of usage, comparison between areas becomes possible even if the areas are very different in nature. In addition to qualitative visitor information, comparable quantitative data on the number of visits to the areas (visitor counts) should be obtained. Land managers, regardless of the ownership of the land, need comparable data in order to monitor the areas' usage and costs.

Public financing sources also need comparable data and monitoring data in order to direct resources to meet the populace's needs for outdoor recreation. For example, on the basis of the amount of use and data on the
usage of money by visitors, one can perform calculations and reach decisions on the national park or recreation area's regional economic impacts. Moreover, monitoring data is also useful for comparisons of management costs of outdoor recreation services versus costs of other leisure services, e.g. indoor sport facilities.

2.2.6 Planning of operations in nature centres or service points

Visitor monitoring data concerning conservation or recreation areas can also be utilized as such at nature centres or service points either in the area or in its vicinity. The results can yield important basic information for determining opening hours, various exhibit themes, and the need for renewal. Visitor information can also be put to good use in planning brochures, identifying and selecting target groups, and determining points of emphasis for nature education.

Workers often collect ongoing feedback from visitors at nature centres or service points, but the feedback is by nature more spontaneous and random. In addition to the ongoing feedback, it can also make sense at times to perform a more systematic customer survey that in fact springs from an interest in matters very similar to those explored in the visitor surveys carried out in conservation and recreation areas. These customer surveys should also be standardized to the extent possible. In this fashion the surveys support one another and the information collected can be used for multiple purposes.

2.2.7 Utilizing area-specific data nationwide and internationally

If one has area specific standardized information across the country, it is possible to assemble a national database from visitor data collected commensurably at state and municipally maintained protected and recreation areas. It may be possible to use statistical information prepared with the aid of national databases to assess recreational services and projects funded through the state budget, and to support the setting of objectives and the taking of decisions for outdoor recreation policy, as well as the implementation of that policy.

Monitoring the sustainable development of natural resources requires up-to-date statistical information on an ongoing basis. With this information it is possible to assess changes occurring in the use of natural resources. In addition, nationwide visitor statistics constitute necessary and useful background information for many studies and policy documents on outdoor recreation.

Nowadays there is also an abundance of European and other international requests seeking nationwide statistics on the recreational use of nature, e.g. the World Commission on Protected Areas, Ministerial Con-
ference on Protected Forest Environment, and EUROSTAT Environmental Statistics.

2.3 Examples on how visitor information has been used

2.3.1 Nordic and Baltic countries

The history of visitor monitoring is fairly new in Nordic and Baltic countries, and experience of how visitor monitoring has impacted park management is not well documented. Here are some observations collected from the case studies described in the reports, and some other cases known to the project team.

Denmark
For example, in the forest area “Gl. Kjøgegaard”, collected visitor information gave cause for as well closing down as establishing a number of paths. And, at a more general level, the results from monitoring the recreational visits in state forest areas have formed parts of the basis for budget allocation from the central office of the Danish Forest and Nature Agency to the local districts.

Estonia
In the recreation area Kiidjärve-Taevaskoja several implementations have been or are planned: 1) In considerable of people with special needs a path is being planned to the most visited site. 2) To raise the level of commercial services in the recreation area, co-operation with businessmen shall be improved. 3) To improve the condition of toilets and the general cleanliness, and 4) to manage and to decrease the littering of the environment, monitoring of the condition of the recreation area sites and a ranger project was implemented.

Finland
One of the first visitor surveys in Finland was made in Koli National Park in 1993. It was made to serve the needs of the planning process to develop services in the park. One question considered traffic arrangements. More than half of visitors who accepted the closing of car access to the top of the hill preferred to have a lift instead. A lift was built some years later. In another case, in the Käsivarsi Wilderness area in North-western Lapland, visitor survey data was used as one central data source when establishing use zones for the area.

Sweden
In the Southern Jämtland Mountain (SJM) area, visitor data on recreation conflict (i.e. disturbance of skiing by snowmobiling) has been used by the
county administration board in their work on trail separation in the area. Information on trail preferences has been communicated to local and national snowmobile and ski organizations.

Another example is the visitor surveys undertaken at Fulufjället National Park. In this case, data from the survey done the year before park designation was used to design the management plan of the National Park with respect to zoning of recreation facilities, rules and regulations, etc. The second survey, one year after park designation, was then used as a short term follow up of the management plan and a tool for monitoring changes in park visitation.

A third example is the study by Vuorio (2003) that was used as an input in the local planning process by the Åre and Bergs municipalities for the Southern Jämtland Mountain Region.

2.3.2 United States National Park Service

“The [VSP – Visitor Study Program’s] results are useful and many of our partners are already utilizing the information from the study, such as our local chamber of commerce and their various tourism committees. We have also implemented changes at the park level to improve our signage and wayside exhibits. Many of the changes will enhance a visitor’s experience at our park, and are cost-effective for us to implement.”

Superintendent, Knife River Indian Villages NHS
(Serving the Visitor 2003, p. 4)

Other examples of how parks have used VSP results (Serving the Visitor 2003, p. 4):

- Kenai Fjords NP shared their data with their community and development groups, which helped obtain funding to build a multi-million dollar state-of-the-art aquarium/research facility.
- Grand Teton NP changed the location of a planned information center after learning that more visitor groups went to another site first.
- Death Valley NP translated safety information into additional foreign languages after learning that 72% of summer visitors were international.
- The Sequoia & Kings Canyon NPs visitor study provided concrete data on visitor demographics/activities and recognition that visitor use is shifting toward day use, allowing adjustment of park operations.
- Catoctin Mountain Park visitor results helped improve the interpretive program and will be used to update the Comprehensive Interpretive Plan, Statement for Management and future General Management Plan.”
• “VSP gives us an important, timely and relevant tool to manage visitor use effectively and provide the best services we can.” – A comment by a park superintendent (Serving the Visitor 2003, p. 4).
• VSP is important for both operational planning and for drafting General Management Plans.
3. Handbooks on and methods of visitor monitoring

Handbooks on visitor monitoring are not very common, and most of them come from countries other than Nordic or Baltic, particularly from the United States, Canada and the United Kingdom. Nordic and Baltic countries have some special circumstances, and therefore one should keep in mind that the know-how of methodology is not directly transferable to Nordic and Baltic countries. One of the most significant differences is the traditional right of common access, also called Everyman’s right, which has a long tradition in the Nordic countries (Nordisk Ministerråd 1997). This short overview gives a brief look at some of the visitor monitoring manuals currently available.

In Finland, there are two handbooks published by Metsähallitus: The Visitor Counting Manual (Horne et al. 1998) and The Visitor Survey Manual (Erkkonen & Sievänen 2001). These Finnish manuals have been mostly translated into English as part of this project. They have provided plenty of working material for this project, and they will be used as a basis for the Nordic-Baltic manual on visitor monitoring.

The visitor counting manual (Horne et al. 1998) describes the strengths and weaknesses of different visitor-counting methods and advises the reader on how, with the use of electronic counters, data regarding the numbers of visitors to conservation and recreation areas, are collected with the greatest possible reliability and economy. The manual is intended primarily for those personnel of Metsähallitus (the Finnish Forest and Park Service) and the Finnish Forest Research Institute who plan interpretive services, service facilities, and the channelling of use in conservation and hiking areas. The manual is also well adapted to the collection of visitor data in conservation, recreation, and outdoor exercise areas managed by municipalities or associations.

The visitor survey manual (Erkkonen & Sievänen 2001) aims at standardizing visitor surveys performed in Finland’s conservation, hiking, and recreation areas. The objective is to produce commensurable and comparable data on the same basic issues. The manual presents the visitor survey's different phases and instructions for reporting survey results, and finally explains how the results can be utilized in practice. The manual also presents a basic visitor survey form, which, with minor editing, can be adapted as a functional form for very different areas. The visitor survey manual is intended primarily to help those who plan the use of conservation and hiking areas and develop the areas' service facilities and provision of information.
In Sweden there are two very recent manuals; they both came out during the course of this project, in 2005. One is more generally a handbook for making visitor studies in nature areas (Lindhagen & Ahlström 2005), another being more focused on counters, and particularly one type of counter, i.e. the radio beam counter (Naturvårdsverket 2005a, 2005b). The Lindhagen & Ahlström (2005) handbook is mainly directed at administrators and managers of recreational areas. Its purpose is to describe a number of effective methods for learning more about those who currently make use of, or those one would like attract to, a particular recreational area. For a broader description of these handbooks, see chapter 4.6. (Fredman: Visitor Monitoring in Sweden / Onsite studies.)

In the United States, the USDA Forest Service has a fairly recent guidebook on wilderness use estimation (Watson et al. 2000), available in pdf-format: http://www.fs.fed.us/rm/pubs/rmrs_gtr56.html. It is targeted at wilderness managers and others who have the responsibility of monitoring and describing visitor use in wilderness. It is a comprehensive manual on estimation techniques and procedures that are essential to appropriately and accurately measure visitor use-related characteristics and conditions. The handbook provides information on setting objectives, making decisions about what to monitor, developing a sample plan, collecting the necessary information, and computing basic statistics to provide input for management decisions.

In the United States, the USDI National Park Service has a two-level visitor monitoring system. The Visitor Study Project (VSP) is the primary visitor study project funded directly by the NPS Social Science Program. The VSP conducts in-depth studies in units of the National Park System annually. They also conduct the annual Visitor Survey Card (VSC) in most units of the National Park System. The VSC is a short customer satisfaction survey. More information on VSP and VSC is available at: http://www.psu.uidaho.edu/. The VSC has produced a guide book for parks to use as they administer the annual customer satisfaction survey (http://www.psu.uidaho.edu/vsc.workbook.htm).

The USDI National Park Service Social Science Program also oversees the Public Use Statistics Office (PUSO) based in Denver. The PUSO is responsible for counting visitation to units of the National Park System (http://www2.nature.nps.gov/stats/). The PUSO has developed counting methods for all participating parks. Information on their methods is available on the PUSO Web site, Visitation Section at: http://www2.nature.nps.gov/stats/.

Also, some less recent handbooks exist in English from Scotland (Dales et al. 1993) and the United States (Yuan et al. 1995).

All the manuals emphasize the importance of building a visitor monitoring process or programme. For example, as Watson et al (2000, p. 2) state it:
“Measurement techniques alone do not constitute a use estimation system. Instead, a use estimation “system” is a conceptual structure comprising five essential steps:

1. A statement of objectives
2. Identification of the specific use characteristics to be measured
3. Choice of appropriate wilderness visitor use measurement techniques
4. Choice of the appropriate strategy for sampling
5. Choice of a specific technique and/or procedure for data analysis and summary.”

Or as Yuan et al. (1995) state it:

“The process of estimating use correctly is guided by a properly designed sampling plan, proper selection of measurement techniques, data collection, and analysis of data and conversion to usable information.”

Hornback & Eagles (1999) provide tools for building and estimating a full Public use reporting programme.

Due to their goals of providing information on visitors and their interaction with a particular nature area, all of these handbooks have a focus on on-site monitoring of visitors (surveying and counting of visitors in a specific area). None of them provide tools for general population surveys (studying individuals or households at their home). The handbooks do consider visitor monitoring in different settings from remote protected areas to close to urban recreational areas. They cover a wide range of visitor monitoring methodology, both counting and surveys.
4. State of the art in the Nordic and Baltic countries

This chapter provides an insight into what has been done in the Nordic and Baltic countries regarding visitor monitoring. In addition to the general description of what has been done in each country in the field of visitor monitoring, there are country specific case studies representing both visitor surveys and visitor counting (Appendices). They provide examples on both why to carry out visitor monitoring and how to do it.

Despite the fact that this project focuses on actual users of the area, and especially on on-site visitor monitoring methods instead of general population surveys, these state of the art reports include national surveys in those countries where applicable. This was considered important to give a holistic picture of a country specific situation.

4.1 Visitor monitoring in Denmark

Frank Søndergaard Jensen and Hans Skov-Petersen
Danish Centre for Forest, Landscape and Planning, KVL

4.1.1 Introduction

Research on Danish forest recreation started in reality in 1975 with the Forest and Folk project, which conducted extensive surveys of the forest recreation activities and preferences of the general population. A research project aimed at producing a better basis for decisions in the field of forest recreation. The surveys are published in four parts: Parts I, II, III and IV of Forest Recreation in Denmark (Koch 1978, 1980, 1984, Koch & Jensen 1988).

In the mid 1990s a new series of surveys was initiated – the Outdoor Life ’95–’98 project. Some of the aims of this project were: (1) to update the previous surveys of recreational forest use and preferences of the general population; (2) to analyse the trends between the 1970s and 1990s; and (3) to study new issues related to outdoor recreation – inclusive expansion of the area from only forest areas to cover the whole countryside. The surveys are published in four parts (Jensen & Koch 1997, Jensen 1998, 1999, 2003).

The Forest and Folk project developed methods for surveying the outdoor life of the Danish population. The surveys in the Outdoor Life ‘95–
‘98 project were based on these methods, to retain the best possible basis for comparisons between the two projects and thus analyse the trends.

4.1.2 National household surveys of forest use patterns

Two national household forest use surveys have been completed in Denmark: Part I from the Forest and Folk project in the mid 1970s (Koch 1978) and the Outdoor Life '95–'98 project in the mid 1990s (Jensen & Koch 1997, Jensen 1999).

Data were gathered in two national postal questionnaire-based surveys in 1976/77 and 1993/94, each involving some 3,000 people representing the adult Danish population. For representative purposes (and minimizing recall errors) the mailing of the questionnaires was distributed over a period of one year (one portion each month).

The Danish population is required to register births, marriages, deaths, changes of address, etc. This provides a very reliable sampling frame (the Civil Registration System, Ministry of the Interior) from which a systematic gross random sample consisting of respectively 3,087 and 2,916 persons has been drawn in 1976 and 1993, representing the adult Danish population, 15–76 years. The samples (and the collected responses) were controlled for representativity (age, gender and county). No significant differences between the samples and the defined population were identified.

The following measures were taken to increase the response rate: (1) care in the design of the visual appeal of the questionnaire package; (2) care in the design of the verbal prompts; (3) a stamped, addressed reply envelope; (4) a relatively brief, simple questionnaire; (5) a potential personal gain for respondents (lottery – only in the 1976/77 survey); (6) the use of up to three reminders, mailed after 2, 3 and 5 weeks. The response percentage was 91.4% for the 1976/77-survey and 83.7% for the 1993/94-survey.

In general, the uses of the forest by the Danish population over the period 1976–1994 have remained relatively stable – although some changes has been detected, including an increase in the number of visits to the forest (by 15% to a total of approx. 75 mill. visits a year), and a decrease in the duration of the visits, in transport time, transport distance and group size. Finally, it was recorded that more forest visitors walked or cycled to the forest rather than driving there by car in 1993/94 than in 1976/77.
4.1.3 Specific surveys of destination areas

Part II of the Forest and Folk project

What is the geographical variation in the intensity of forest recreational use in each region (county) of Denmark? To answer this question – and to give exact data for the manager of the specific forest area, Part II of the Forest and Folk project was initiated.

The yearly number of visitor hours and visits was estimated for 446 forest areas with a total area of 187,000 ha in 1976/77. Questionnaire results for the car-borne use regarding length of stay, group size, activities, travelling time and distance were obtained as well. The basic data collection consisted of 28,652 instantaneous, manual counts of parked cars and the delivering of 44,846 questionnaires. The response percentage for the questionnaires was 53.7% (impossible to use follow-ups). Nearly all state forests and many private forest properties participated voluntarily in the basic data collection. It is assumed that the more intensively used forests are over-represented in the investigation (“close-to-urban state forest areas”). Detailed instructions for the fieldwork were elaborated. The recording was carried out at 20 stratified randomly selected times and at 2 subjectively selected times at peak use. The stratification took the seasonally, weekly and daily variation into account.

Different models for the relationship between the instantaneous counts on each individual area and permanent automatic recording have been considered. (See the description of the permanent counting stations below). The rather simple multiple linear regression model was chosen. If the regression estimate was not significant, or if the regression estimate deviates significantly from the sample estimate, the sample estimate for the area in question has been used (based only on the 20 registrations at randomly selected times). Calculating the questionnaire results is only possible by sample estimates.

The total number of visitor hours was estimated from the number of car-borne visitor hours, the questionnaire results regarding the car-borne visitors’ travelling distance distribution in each forest area, and the relationship between the percentage of the Danish forest visitors who travel to the forest by car at a give travelling distance. The total number visits were estimated from the average length of stay per visit (car-borne/non-car-borne ratios from the national household forest use surveys in Part I).

The results show a large variation in the intensity of use. In most counties it is found that some forests are used up to about a thousand times more intensively than others.

In Koch (1980) detailed descriptions of the different methodological aspects are presented as well as the results. (See e.g. “Visitor survey, Case 2: National visitor survey” and “Visitor counting, Case 2: National counting survey” in appendix 1 for more information).
The Outdoor Life ’95–’98 project
As described for the national household surveys, a need for updating the results was found. Due to this, the Outdoor Life ’95–’98 project was initiated and a new data collection on the specific areas was accomplished in 1996/97. The data collection in the Outdoor Life ‘95–’98 project follows the same outline as described above for Part II in the Forest and Folk project in 1976/77, although some extensions and limitations were introduced:

- Other nature areas than forests were included (e.g. beach areas).
- Instead of 446 areas divided into 1419 sub-areas in 1976/77, the surveyed area in 1996/97 consisted of 592 forest/nature areas (of 2159 sub-areas), with an area of approx. 201,000 ha (174,000 ha forests).
- A total of 85,673 questionnaires were delivered and 46.7% was returned.
- The questionnaire-based survey was extended to include e.g. aspects of crowding, as well as use of and preferences for a number of visitor facilities.
- Due to economic constraints regression estimates were not performed – only sample estimates.

The comparison between the two surveys shows the same tendency as found in the national household surveys of the general public: an increase in the number of visits. The geographical variation in use intensity as described for the 1976/77 survey is more or less retained. For more detailed results and more methodological aspects, see Jensen (2003).

In addition it can be concluded that, compared with the data collection in 1976/77, less private owners found it possible to join the monitoring programme in 1996/97 due to economic recession in the forest sector – and thereby shortage of staff. Based on a decision at the headquarters of the Danish Forest and Nature Agency, all state forest areas participated. (See e.g. “Visitor survey, Case 2: National visitor survey” and “Visitor counting, Case 2: National counting survey” in appendix 1 for more information).

4.1.4 Permanent automatic counting stations

Part III of the Forest and Folk project
Four permanent counting stations have been in use since 1976. These registrations have a two-fold aim:

1. To form the basis for the specific area surveys described above (Part II of the Forest and Folk project), and
2. To describe the time-dependent variation and the trends in the extent of the recreational use of selected locations.

The counting stations operate according to the "net count procedure" i.e. all cars entering and leaving an area (which is only served by a single road for cars) are counted individually, and the results are recorded at the same time and very frequently (every 15 minutes). If the counting is precise, the following variables can be determined:

- Number of cars present at an arbitrary time (difference between the summed up number of entering and leaving cars)
- Number of car visitor hours (with round-error depending on registration interval)
- Number of car visits (directly from the separate in- and outgoing traffic)
- Mean length of stay per car visit (estimated from two last-mentioned variables).

The counting stations are still operating. The practical work of inspection and collecting the data is carried out in cooperation with the Danish Road Directorate. See Koch (1984) for detailed results of time dependent variations and trends in the car-borne recreational use of the four selected forest areas. A detailed description of the methodology and a discussion of counting errors are also given. In appendix 1, more information on the permanent car monitoring can be found: “Visitor counting, Case 1: Permanent automatic counting – car-borne forest visitors”.

4.1.5 Other monitoring

As well as the “centrally collected” information presented here, a number of other periodical/permanent monitoring of the recreational use of different nature areas/green spaces has been accomplished over the years under the auspices of different authorities like municipalities, counties or forest districts. In appendix 1 a couple of such examples are given: “Visitor survey, Case 1: Specific forest/nature areas – exemplified by Jægersborg Dyrehave”; “Visitor survey, Case 3: The Gudenaa River Survey” and “Visitor counting, Case 3: Counting in urban areas”.

In addition, the Danish Centre for Forest, Landscape and Planning has just initiated a monitoring programme in three forest areas, using infrared counting equipment; and started a project, which e.g. will attempt an overview on a national level in regard to what kind of (other) outdoor recreation monitoring that is/has been running “locally” – especially focusing on long term monitoring programmes.
4.1.6 Influences and perspectives

Over the last three decades a number of forestry-related policy issues have been raised via, for example, the Forest Act, the National Forest Programme, the National Afforestation Policy, and the evaluation of access regulations. For efforts in all these contexts, the results of completed basic forest recreation research/monitoring have played a role in discussions of the social component of various pertinent issues.

In conclusion, we believe that the research/monitoring has raised the policy discussion to a more enlightened level. The outdoor recreation research/monitoring has additionally exerted substantial influence, especially on changes to the general aims of the Forest Act (and thereby on forest management in general), as well as on the implementation and priorities of the Danish afforestation programme (where results on the connexion between distance to forest and number of forest visits has been influential) (Jensen & Koch 2004). – And finally, the data have, of course, also played a role at a local level when planning and managing the specific forest/nature area, as well as forming part of the basis for budget allocations to the individual forest/forest district.

As seen above, a number of efforts have been accomplished in obtaining data on visitation and visitor behaviour over the last decades – but with different intensity over time and space. On this basis, a more formalized and standardised programme for “National Visitor Monitoring in Denmark” seems to be needed. Policy makers and managers have showed interest for establishing such a “permanent” programme, and the Danish Centre for Forest, Landscape and Planning is in a phase of giving advice on the formulation of such a future monitoring programme. The hope is to be able to establish a monitoring programme for outdoor recreation, which can be comparable to the “National Forest Inventory” and a number of more biological and environmental monitoring programmes at a national level.

An example of a document where this interest is formulated is the “Danish National Forest Programme”, where numerous references are made to the importance of outdoor recreation. A couple of excerpts with special emphasis on monitoring/statistics/research are given here:

"The linkage between forest research and forest policy processes is seen as particularly important for a sound development of the forest sector. This is well in accordance with proposals for action from IPF (58b(vii)) and IFF (96c). Furthermore, the resolutions from the Ministerial Conferences in Helsinki (1993) and Lisbon (1998) also establish that the European countries are obliged to improve and adapt the national forest monitoring programmes to the need for documentation of sustainable forest management operations. This will be put into practice through for instance:

- following and documenting the conditions and development trends in the forests;
• documenting the multiple functions of the forests (wood production, 
  forest health, biological diversity, outdoor recreation);
• substantiate that the established goals have been fulfilled.”

“In the coming years, forest-related research will in particular be concentrated 
on:
• Environmental economics and environmental sociology;
• Environment and health, including outdoor recreation;”.

4.2 Visitor monitoring in recreational areas in the State 
Forests of Estonia

Anu Almik
Riigimetsa Majandamise Keskus, Estonian State Forest Management 
Centre (RMK)

4.2.1 The recreational areas in the Estonian State Forests

The Estonian State Forest Management Centre (RMK) is the agency re-
sponsible for the management of about a half (1.08 million hectares) of 
the total forested area in Estonia (2.2 million hectares). In addition to 
forest regeneration, silvicultural activities and timber production, RMK is 
also charged with the development, organization and provision of recrea-
tion opportunities in state forests. Since 1997 RMK has been developing 
diverse opportunities for outdoor activities in 10 recreational areas.

The recreational areas of RMK are located in both commercial forests 
and protected territories. According to the Forest Act, forest management 
in a state forest is organised by RMK or in a protected forest of a pro-
tected area by the manager of the protected area. This means that RMK 
organises forest management in addition to commercial forests also in the 
special management zone of the protected area, where economic activi-
ties are allowed pursuant to the protection rules of the protected area, and 
also in the limited management zone. To operate in the protected areas, 
RMK has concluded respective contracts with the managers of the pro-
tected areas. Consequently, the visitor monitoring in RMK recreational 
areas that are dealt with below do not provide an all-inclusive view of the 
recreational use of Estonian forests.

One of the main objectives of Estonian forest policy is the sustainable 
(harmonious, on-going and versatile) management of forests. To achieve 
this aim and also to provide visitor monitoring in recreational areas with 
legislative support, the Estonian environmental strategy for 2010, among 
other issues, includes the task of organising the monitoring of the users 
and the use of recreational landscapes and the related rectifying activities. 
In addition to the above-mentioned documents the obligation of RMK to 
deal with visitor monitoring arises from the Forest Act of Estonia and the
Forestry Development Plan of Estonia up to 2010, which imposes very specific responsibilities on the manager of a state forest to carry out all the work necessary for as extensive as possible use of the state forest, including recreation.

4.2.2 Visitor surveys

To reveal the development needs of recreational forest use and to make optimum financing decisions, RMK has conducted visitor surveys and visitor counts in the recreational areas since 2002. In 2002 the visitor survey was carried out on all 10 recreational areas of RMK to establish the motivation, preferences and needs of visitors in recreational areas and to determine whether the developed facilities meet the expectations of the users. The visitor survey was repeated in 2003 using the revised method. In 2003 the visitor survey in RMK recreational areas was based on the visitor survey manual of Metsähallitus.

For the collection of data for the visitor survey, on-site guided questionnaires were used. The target sample size in each recreational area was 300. The sampling method used was the random sample. The data collection period was from June to September, which is the high season for outdoor recreation. The data collection sites were the most visited objects in the recreational area. In all the recreational areas the same questionnaire form was used, to which area-specific questions could be added. Information was collected about the profile of the visitor, activities, distribution of use in the area, visitor satisfaction, duration of the visit and expenditure during the visit (more precisely about the sampling method and the list of variables see appendix 2: “Case of a Visitor Survey in RMK Kiidjärve-Taevaskoja Recreation Area 2003”). For the analysis of data the MS Excel spreadsheet programme and a separate special application was used. The data collected in the course of the visitor survey are used to find out the development needs of the recreational area and to organise the activities.

The results of the 2002 visitor survey conducted in RMK recreational areas also showed that the public is not aware of the opportunities offered for outdoor recreation in state forests and actually does not use the public information channels. The visitors also stressed the scarcity of on-site information – drawbacks in signage and maps of recreational areas.

Upon carrying out the analysis of the shortcomings different measures were introduced to improve the provision of information and guidance to the public: information desks were established in recreational areas, the website was updated, leaflets and maps of the recreational areas were issued and events were organised to increase the awareness of the public of the present outdoor recreation opportunities. The development of the principles for the uniform guidance and signage system was undertaken.
Among other issues, the results of the 2003 visitor survey showed that the recreational areas of RMK are not the main destination. 41% of the visits are of short duration. Visiting of recreational areas of RMK is concentrated on a few sites. The estimations concerning kiosks, cafes and the level of provision of facilities for visitors with special needs were more moderate.

The results of the visitor survey were analysed after the reports were completed. It was possible to identify the most often visited recreational sites on the basis of the 2003 survey. The aforementioned findings were used to specify the locations for the installation of electronic counter units for visitor volume studies.

The optimisation of the territories of recreational areas and the linking of separate sites with the trail network was undertaken in order to increase the attractiveness of the recreational areas of RMK and to prolong the duration of visits to these areas. The requirements of visitors with special needs are taken into consideration in developing integrated solutions. The level of commercial services is being improved in close cooperation with businesses.

4.2.3 Visitor counting

Visitor counting is continuously conducted in all ten RMK recreational areas in the period of unfrozen land. In 2002 the first counters were installed at the focal points of visitor traffic in a recreational area, whereas the selection of the location of counters relied on the estimates of the manager of the recreational area. In 2003 counters were installed in the rest of the areas. On the basis of the results of the 2003 visitor survey, the counter locations were specified and additional counters were placed. As of 2005, there are 29 electronic counters installed in RMK recreational areas.

Besides electronic counters we also use mechanical ones. Most of the electronic counters are pressure mat counters. Mechanical counters are mechanical stroke counters that are fixed to the door. The installation of counters, taking counter readings and the maintenance and calibration of counters is based on the visitor counting manual and instructions provided by Metsähallitus.

The counter reading is taken and the counter is serviced on a regular basis. When the reading is taken, the time, date and reading are recorded. At the same time the condition and the functioning of the counter is checked and recorded. In order to determine the number of visits as exactly as possible, a correction coefficient is found for each counter. To find a reliable coefficient, each counter is calibrated by monitoring the counting station for at least 30 hours during the season. The observation period is 4–6 hours. The observation period includes different days of the week, times of the day, visits of different groups, etc. The calibration
diary is standardised: it records the time of the start and end of the observation, the number of people passing by the counter and their direction, the counter reading and other factors that may have an impact on the counter reading.

What needs developing in visitor counting is the expansion of the number of visits counted in single sites to reveal the number of visits in the whole recreational area. RMK has started negotiations with the Estonian Agricultural University with the aim of finding a theoretical basis and guaranteeing sufficient reliability for estimating the number of visits to the entire recreational area, the inputs being the number of visits counted in single sites and the proportion of visits to objects gained from the visitor survey.

4.2.4 Population surveys

Besides the visitor surveys and the visitor counting in recreational areas, the surveys elucidating the attitudes of the population play an important role. For that purpose supporting and background surveys were conducted by two different survey research companies employed by RMK in 2003 and 2004.

The objective of the survey of environmental awareness was to learn the opinion of the residents of Estonia regarding the state of the natural environment and to analyse the significance of forests to the public. The survey was conducted by TNS Emor in the spring of 2003. The sample is made up of 1,011 permanent residents of Estonia aged 17 to 74. The survey indicated that about half of the total population of Estonia visits forests at least once a month, about 2/3 are aware of, or have heard of Everyman’s right, and the most favoured outdoor activities include the picking of forest products, spending of leisure time and various leisure sports activities. Forest is valued as an important element of the environment and in particular the younger urban people appreciate forest as an environment suitable for recreational activities.

The primary objective of the study of 2003 on outdoor recreation was to find out the level of awareness of the residents of Estonia concerning the opportunities developed by RMK for the outdoor recreation activities, the level of the demand for and use of offered opportunities and the volume of visitors. The study conducted by the Survey Research Centre Faktum in the autumn of 2003 was structured as a face-to-face interview of 969 residents of Estonia aged from 15 to 74. The results of the interview indicate that 82% of the 15–74 year-old population of Estonia is aware of the opportunities for outdoor recreation developed by RMK, 94% consider them essential, and 55% use them.

The aim of the outdoor recreation surveys in 2004 was to specify the percentage of the Estonian population which visits RMK recreational areas at different seasons of the year and their main reasons for outdoor
recreation. The Survey Research Centre Faktum conducted four surveys at different seasons in 2004. In total the sample included 3916 inhabitants of Estonia, aged 15 to 74. As a result it was revealed that on average, within the last three months during the observed season 29 per cent of the population had visited the RMK recreational areas. In the so-called mild seasons – in spring and autumn – the proportion of visitors is on the average level, in the winter period there are 10 per cent fewer visitors than the average, and in summer 10 per cent more. Among the three reasons for outdoor recreation the respondents most frequently pointed out the quiet enjoyment of nature (80%), gathering flowers, berries and mushrooms/branches, ornaments etc. (48%), wandering, hiking (35%) and picnics (34%).

4.2.5 Assessing environmental impacts of recreation

As the popularity and the load of the recreational use of forests grow, the monitoring of recreational areas acquires an important role. In 2002 the Estonian Centre of Forest Protection and Silviculture, ordered by RMK, started the assessment of the environmental impact of recreation and the carrying capacity of forests. Since then, such assessment has been conducted in six RMK recreational areas and one planned area. In addition to this, a repeated survey has been conducted in one research area. In the course of these studies recommendations were prepared to preserve the appearance of the researched areas and to compensate the wear, and therefore, to increase the carrying capacity. The recommended measures have been applied in RMK recreational areas. The carrying capacity research in RMK recreational areas is being continued according to the developed methodology.

The previous research forms an efficient basis for the further development of RMK recreational areas, taking account of the user needs, and serves as a tool for the supporting funding plans concurrently ensuring the preservation of the recreational values of landscapes.

4.2.6 Strengths and weaknesses

A strength of Estonia is that visitor monitoring in RMK recreational areas (RMK manages 1.08 million hectares of forest) is conducted on the same basis and the manager itself conducts visitor monitoring to clarify the development needs of recreational areas and to organise the activities. Also, the different surveys (visitor survey and counting, population surveys, assessment of environmental impact of recreation) and their results are dealt with in a complex way. However, there are no complete data about the recreational use of Estonian forests due to the different forms of land ownership and different management situations. Neither are there
standardised methods, the implementation of methods, data processing and analysis tools that are used all over Estonia.

4.3 Visitor monitoring in Finland

*Joel Erkkonen and Tuija Sievänen*
Metsähallitus, Natural Heritage Services

4.3.1 Background

In Finland the number of recreational visits to protected and recreational areas is continually growing, thus presenting increasing challenges in the planning of their management and use, although this also creates new opportunities. The growing numbers of visitors may sometimes lead to increasing problems in relation to the ecological and social carrying capacity of the protected and hiking areas. Heavy visitor traffic causes deterioration and other disturbances in the terrain from the perspective of nature conservation, if the recreational use is uncontrolled. Visitors may also experience congestion as being disturbing to their own recreation.

At the same time, the amount of budget funds allocated to recreation services has not increased to meet the growing service needs of the increasing number of visitors. It has become more important than ever to know how many visitors use the area, and also to know the visitor profile and visitors' opinions of the area and the services provided, so as to manage and to prepare for changing situations in advance.

Besides the number of visitors (i.e. number of recreational visits), other information on visitors is also necessary. This is gathered by means of visitor surveys. Visitor counts and visitor surveys are complementary to each other and they should be carried out simultaneously (Erkkonen & Sievänen 2001).

4.3.2 Standardisation of visitor surveys

There were several reasons for the standardisation of visitor surveys in Finland. Some visitor surveys had been conducted earlier in municipal recreational areas and state-owned hiking areas and national parks. In several contexts, it appeared to be necessary to compare visitor information gathered from different areas or from the same area at different times.

Furthermore, there was, and still is, a need to collect information on the demand for outdoor recreation throughout the country. This was the motivation behind the compiling of a national outdoor recreation demand and supply inventory (LVVI). The nationwide demand for recreational use was studied with the help of an extensive population survey. Another
approach to assess demand in the LVVI study was to develop methods for visitor surveys that would enable us to obtain comparable information on the use of the individual areas, e.g. visitor information (Sievänen 2001).

The aim of the visitor survey standardisation project was to evolve a method for gathering data, tested indicators for visitor information and also calculation and reporting methods. Another objective was to produce a manual for conducting visitor surveys and utilising visitor information in planning the management and use of the areas. The visitor survey standardisation project was conducted in cooperation by METLA, Metsähallitus and the University of Helsinki in 1998–2000.

Only the most relevant issues that are usually of interest in visitor surveys were included in the questionnaire. Special attention was given to the formulation of the questions and to the structure of the questionnaire. The standard questions form the basis of the questionnaire in all visitor surveys, but there is also room for questions specific to the areas. The standard form has been tested and further developed as experience has accumulated. It has evolved into a basic form that is effective and can easily be applied in different areas.

The actual outcome of the project is the visitor survey manual (Erkkonen & Sievänen 2001). The manual contains comprehensive instructions for carrying out a visitor survey, reporting its results and utilising visitor information (Fig. 1). The purpose of the manual is to facilitate the conducting of visitor surveys, so that the basic tools, such as the questionnaire and the report model, are ready for use after minor modifications in each individual area. The manual also gives instructions for planning sampling and the arrangements for data collection.
An MS Excel (Excel 97) application was developed during the project for saving the forms and processing the data. It produces various tables and graphs (direct distributions and means), which can then easily be transferred to the report. The application produces the results in the form of the report model presented in the visitor survey manual (the information to report is described in Fig. 1). This makes it considerably easier to compare the results for different areas or within the same area. The application is used by Metsähallitus.

About 50 visitor surveys have been conducted in state-owned protected and hiking areas in 1998–2005. The surveys have been carried out using the standardised method, and their results are for the most part comparable. For more information on standardised visitor surveys, see appendix 3: “Visitor Survey: Case of Standardised surveys in state-owned protected and recreational areas managed by Metsähallitus”. For a case of a visitor survey implemented in an urban recreation area prior to the standardisation project, see appendix 3: “Visitor Survey: Aulanko and Ahvenisto Urban Recreation Areas in City of Hämeenlinna”.

4.3.3 Standardisation of visitor counts

Reliable estimates of the number of recreational visits are extremely important for planning and managing the use of the areas in question. On the basis of such estimates, it is possible to obtain a clearer picture of the use of the area and the sites where visitor traffic is heaviest. Information on visitor numbers helps the people responsible for managing the areas to control the flow of visitors, for example, by directing them to routes that cause less deterioration to the vegetation and landscape. In addition, visitor counts also help to maintain and develop services so that they better correspond to the real number of visitors to the area (e.g. firewood supply and waste disposal).

The first manual on visitor counting in Finnish was published by Horne et al. in 1998. Before that good models were found in English from Scotland and the United States (Dales et al. 1993, Yuan et al. 1995). With the help of the visitor counting manual, Metsähallitus has begun to count visitors (visits) to the areas, especially in national parks and hiking areas, more systematically and consistently during the past five years.

In order to ensure quality and commensurability of the results, the personnel participating in the counts are trained in almost identical situations. The training deals with the basic elements and aims of visitor counting as well as counter technology and installation techniques. In the context of basic elements and aims, efforts have also been made to influence attitudes.

Nowadays, Metsähallitus has about 200 electronic visitor counters installed along hiking trails and roads throughout the country. Metsähallitus has also done quite a lot of development work with other partners in rela-
tion to visitor counters. However, there is still much development work to do regarding maintenance and reliability of counters. For an example of visitor counts, see appendix 3: “Visitor Counting: Case of Arctic Circle Hiking Area”.

4.3.4 Future challenges of visitor monitoring

In Finland, the main body of experiences on visitor monitoring comes from state-owned protected and recreation areas, which typically are located relatively far from the residence of visitor. There is very little information on the volume of recreational use in urban forests and local recreation areas. Very few municipalities have collected much visitor information in their parks and recreation areas.

The standardised methodology described here is well applicable to a similar kind of areas, whereas its applicability is not so good for urban or rural areas in local use. Consequently, in Finland, we still lack well-tested visitor monitoring methods for urban and local recreation areas, for trails and for special recreation service points such as harbours or skiing centres.

With regard to state-owned lands, in order to further develop practices related to visitor information processes, Metsähallitus has launched a development project for 2005–2006. Metsähallitus is compiling all the essential information under one process and one data management system. In practice, this information means visitor surveys, surveys of nature tourism enterprises, continuous customer feedback and visitor counting both in areas and at customer service points, as well as outdoors.fi-web pages. In this project Metsähallitus will improve the reliability, accessibility and applicability of visitor information by

- combining the currently somewhat separate processes of visitor monitoring into one entity
- developing a uniform data-base application
- updating the Metsähallitus guidelines and manuals for visitor monitoring
- training the personnel to use the updated methods and the new application

With the help of the development project, Metsähallitus should be able to utilize the visitor information more effectively and consistently in the future.
4.4 Visitor monitoring in Lithuania, in Kursiu Nerija (the Curonian Spit) National Park

Lina Dikšaitė
Kursiu Nerija National Park Administration

Kursiu Nerija National Park is one of the five national parks and one of the most important tourism destinations in Lithuania. It was established in 1991 to preserve the most valuable complex of Lithuanian seaside with its unique landscape and the dune ridge, natural and ethnocultural heritage, for sustainable use and its care. (Category II in the classification of IUCN).

The first survey of holidaymakers in the Curonian spit was conducted by the Lithuanian Agriculture Academy in 1991–1993, especially for the first national park management plan. Data were collected during sociological surveys. The researches analysed the character of holidaymakers’ activity. The first plan of the National Park set the carrying capacity limit for some recreational zones of the national park. During the past 10 years Lithuania has experienced huge economical and social changes and the carrying capacity limits are out-of-date.

The start of visitor monitoring in the National Park can be dated back to 1996, when the Administration of the National Park was established. Since then, the Administration has been collecting information about numbers of persons and transport entering the National Park and the number of visitors in the National Park Visitor centres. More detailed surveys of the National Park visitors, their recreation behaviour, and intensity of visits have not been undertaken.

4.4.1 Visitor counting

Kursiu Nerija National Park is in a specific geographical position. It is a peninsula divided by two countries. The access of people from the Lithuanian side is limited by water: visitors can reach the Curonian spit only by ferry or by private ship. People coming from the Russian side have to cross the border control quarter. This position is very favourable for visitor counting. Every year the National Park Administration receives the data on the number of visitors from a company called JSC Ltd., “Smiltynes perkela” which operates ferries, and from the Nida border control quarter. These data permit the National Park to analyse visitor flows, the different kinds of transportation used, and changes during the year.

The data gives us only the general numbers of visitors and transport. It is very important to know how this visitor flow is distributed over the

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1 Editor’s comment: In the case of Lithuania, we have an example of one protected area, Kursiu Nerija National Park, because national state of the art report was not available.
area. The Administration of the National Park collaborates with the Tourism and Recreation Department of Klaipeda University. Students are involved in the data collection on transport flows and its analysis. The research was conducted for two weeks in the same place three years in succession. Students observed and registered the number of vehicles and their distribution over the area. There are no electronic or mechanical counters in the national park, so the people carried out the same work that can be accomplished by equipment.

The future challenge in Kursiu Nerija National Park is to further develop visitor counting methods and to improve the methodology. Collaboration with educational institutions would help to prepare a theoretical basis and ensure the reliability of studies.

4.4.2 Visitor monitoring in the Visitor Centres of the National Park

There are two Visitor Centres in the National Park. The staff at the two centres collects data about visitors using a special form. On this form we mark the number of persons, from which country their arrived, and what they were interested in. In the same way the contacts via e-mail or phone are registered.

The collected data gives the National Park information about the number of visitors per month or per week in the Visitor Centre, the nationality of the visitors, the most common queries of tourists, and changes in tourist numbers.

The Visitor Centres of the National Park are good locales to start more detailed visitor surveys. It would be very important to obtain information about the characteristics of our visitors, their recreational behaviour, etc.

4.5 Visitor monitoring in Norway

Odd Inge Vistad
NINA, Norwegian Institute for Nature Research

Management of protected areas and recreational areas in Norway has not – generally speaking – included visitor monitoring. The reason has partly been low management budgets, but also management priorities. There are, however, some regional examples of managers and authorities giving priority to social monitoring, in both recreational and protected areas (especially in the counties of Rogaland and Nordland). There are also several other examples of registration of recreational activities and other social conditions, but not as long term stable monitoring – see below.

In Norway the same national authorities are responsible for nature conservation, biodiversity, and pollution control, for handling other environmental challenges, and for managing outdoor recreation (friluftsliv).
And to be a little bit ironic: “Fire fighting” (protecting the environment) is generally more important than managing and stimulating “leisure activities” (friluftsliv) – especially with limited budgets. This might be one of the reasons why monitoring in Norway has almost solely been understood as biological monitoring. Several systematic biological national monitoring programmes exist, with special focuses and good scientific foundation, for instance on sea birds, forests, wild reindeer, etc. The most relevant and stable monitoring in protected areas in Norway has probably been the national TOV-monitoring (monitoring of terrestrial biodiversity) lead by DN (Directorate for nature management) and implemented by NINA (Framstad et al. 2003). Some of the biological monitoring experiences, however, difficult conditions, with low funding, and partly incidental implementation; a lot of monitoring work is done voluntary by skilled persons engaged in environmental or biological organisations. Huge amounts of relevant biological data has been collected in protected areas, at a low cost, but too often the systematic building of long term accessible data bases is lacking (Hagen et al. 2005).

One of the main reasons for nature conservation is (stated as a political goal) “A representative selection of Norwegian habitats shall be protected for future generations” (St. meld. Nr. 21 (2004–2005)). One important measure for achieving this is to develop management plans for the national parks and other large protected areas, and to ensure that an active management regime is pursued in these areas. Biological and visitor monitoring is needed in these parks as a basis for appropriate management.

4.5.1 General population studies

The only long term systematic building up of statistical knowledge concerning friluftsliv (outdoor recreation) is done at a national level through Statistics Norway (Statistisk Sentralbyrå – SSB). Roughly every third or fourth year since 1970 a random nationwide sample of about 3000 adult inhabitants (16 years or older) are interviewed about living conditions, including for instance what kind of leisure and recreational activities they have practised, and how often, during the last year. Questions on motivation for friluftsliv have even been included in some of the years. The list of relevant activities is gradually being expanded and developed as the recreational field develops.

These national surveys form monitoring tools connected to one of the political goals for friluftsliv in Norway: The tradition of outdoor recreation (friluftsliv) based on the right of access to uncultivated land shall be kept up by all sections of the population (St. meld. Nr. 21 (2004–2005)).
4.5.2 Onsite monitoring

Very little social monitoring, if any, has been initiated by the central authorities, except when connected with research projects or pilot projects. Most of the onsite social monitoring (meaning: usually a one time visitor registration) has been carried out in connection with educating students within the fields of nature management, geography, sociology, landscape architecture or outdoor recreation (at universities or university colleges), and especially as part of master degree or PhD work. The sites studied are typically urban forests (for instance, Oslomarka, Bymarka in Trondheim, Skiensmarka and others), national parks (for instance, Reisa national park, Femundsmarka National Park and Dovrefjell National Park), or along the coastline. The first projects of this kind date back to the mid 70s, with an increase through the 80s and 90s. All these projects are, of course, reported.

In addition there have been special research projects (partly funded by the Ministry of Environment, Directorate for Nature Management, or other state or public management authority) and social-ecological research programmes (funded by the Norwegian Research Council) during the 90s and forward, with special focus on friluftsliv and nature management challenges. Sometimes the research questions have primarily been connected with social and psychological issues (the recreational activities – motivation, experiences, satisfaction, barriers etc.), but mostly nature management issues like facilitation, information, ecological impacts, preferences, behaviour, etc. have been in focus. Very often these projects have been implemented as joint projects between the academic institution and the actual management authority. Some of the studied locations are Stabbursdalen national park, Sølendet nature reserve, Fjorda canoeing area, Femundsmarka national park and Jotunheimen national park. Several research units have been involved (for instance, Eastern Norway Research Institute, Western Norway Research Institute), but the Human-Environment Division (at Lillehammer) of NINA has probably implemented most such projects. All of the mentioned projects have included visitor surveys (partly by using self registration boxes and partly through personal interviews), and some of them also visitor counting (beam counters, and manual counting of visitors, parked cars, etc). All the studies have been reported.

The Norwegian Mountain Touring Association (Den Norske Turistforening – DNT) has been responsible for several visitor studies in some of their important hiking areas (in established or planned national parks with surrounding mountains). The main reason has been to evaluate their own commercial and recreational activity, in relation to “nature’s carrying capacity”. It all started in 1994–95 in Rondane (with the core area being the oldest Norwegian national park – established in 1962). The survey was initiated and mostly conducted by DNT (with help from many DNT-volunteers), but in close cooperation with the management authori-
ties, the County Governor (Fylkesmannen) of Oppland and the Norwegian State Forestry Commision (Statskog). In addition the Eastern Norway Research Institute played a consulting role. The survey was the main element in a master thesis at the University of Agriculture (today called the Norwegian University of Life Sciences – UMB). The Rondane area was chosen because it is one of the most visited mountain areas in Norway where DNT has several cabins and marked trails. It is also an important area for wild reindeer – a species for which Norway has a special international responsibility. A combination of manual counting and interviewing was conducted (DNT 1996, 1998). Later three other mountain areas have been investigated in a similar way: Hardangervidda, Dovrefjell, and Tafjordfjella (between 1998 and 2002). Only the Rondane project is reported.

The Norwegian Nature Inspectorate (Statens Naturoppsyn – SNO) was established in 1996 as a section within the Directorate for Nature Management (DN). SNO has a sub-section on national park responsibilities. SNO is a national office, but with local divisions. Many of these local divisions are located close to the bigger national parks. SNO has several responsibilities, especially in national parks and other conservation areas: on preventive issues, restoration, information, documentation, and on control. SNO has continuously expanded its activity (Falleth & Saglie 2005) and monitoring is about to be given priority. But a realisation of practical monitoring very much depends on the political and economical priorities from the Ministry of the Environment. Recently SNO implemented an internal e-mail inquiry on what has been done concerning social monitoring in the conservation areas, and where and how has it been implemented. Shortly summarised eight cases of some kind of social registration/monitoring have been reported. All of them represent some kind of counting, more or less systematic: manual counting (cars, boats, snowmobiles or hikers), ticket sale on tourist boats, number of over-night stays on tourist huts, and analysis of guest books. But there is also an example of the use of a home made “click” counter, and one study where a beam counter was used (in cooperation with a research institute).

The County Municipality of Rogaland has a long tradition in giving priority to outdoor recreation (facilitation, stimulation, etc.). In the late 90s they also started visitor monitoring using automatic counters (mostly trampling mats, but also radio beam counters) in cooperation with the different Inter-municipal Recreational Boards in Rogaland. Both recreational areas and entrances to protected areas were or are being monitored. None of these studies have been reported; the collected data have been used in the daily management of the areas. There are some mixed experiences with the registration equipment – both the mats and the early versions of the radio beam counters – both from Scotland. The same type of trampling mat has also been used in other areas, and sometimes with difficulties. Bergen Turlag (a regional branch of DNT) has used them in the
mountains around Bergen, and DNT has used them Grimsdalen in the Rondane area in 2002. The experiences were not good in Grimsdalen. None of these studies are reported.

In Northern Norway (the three northernmost counties) most of the land is state land, managed by the Norwegian State Forestry Commission (Statskog). Their practical management division is called The Mountain Ranger Services (Fjelltjenesten). Facilitation and stimulation for Friluftsliv is very much a part of the priorities and responsibilities of Fjelltjenesten, but social monitoring has not been given priority, with one recent and very interesting exception: During the spring of 2004 collaboration between Statskog Nordland and Nordland Fylkeskommune (Nordland County Municipality) started a visitor counting project in six different recreational and protected areas. Nordland is the county in Norway with the most national parks. Several entry points to these parks and some recreational areas were chosen for visitor registration. The registration equipment comprises trampling mats from Schmidt Electronics (see previous paragraph), meaning mats that are dug 6–7 cm down in the trails, before earth and gravel is replaced on top. The mats are connected to data collectors. A working paper is presented (Statskog Fjelltjenesten & Nordland fylkeskommune 2005). This is most surely the most comprehensive counting project in Norway implemented by a management authority. See details in appendix 4: “Case of visitor counting in six areas (partly conservation areas) in the county of Nordland”.

4.5.3 The present and the future?

The Directorate for Nature Management (Direktoratet for naturforvaltning – DN) has recently initiated a new monitoring “focus” for the protected areas, and social monitoring forms a part of this new emphasis. This does not necessarily mean a comprehensive nationwide raise in funding and priority for social monitoring in the protected areas – that remains to be seen – but it gives some positive signals for the future. The most concrete “outcome” – so far – is probably a pilot project on monitoring development (both social and ecological) in the Dovrefjell-Sunndalsfjella (a complex of protected areas) during the spring of 2006. The goal is to develop a monitoring plan tailored to the protection goals and the practical management challenges in the park. This pilot project – implemented by NINA in cooperation with SNO – is also supposed to sketch monitoring more principally for Norwegian national parks with surrounding areas.

The present optimism concerning social monitoring is also connected to the political fact that our national parks and other protected areas have been given a special position in the near future development of Norway as a nature tourism product on the international arena, primarily through
the new tourism action plan (Nærings- og Handelsdepartementet 2005). But this development has also been given some legitimacy through “Fjellteksten” (“The mountain text”, St. prp. Nr. 65 (2002–03)) which removes the last doubts on the principal possibilities: Commercial activity is now legal within the national parks; it is just a question of “what”; and “how” this “what” can be developed in an acceptable way, in relation to the protection goals and the relevant stakeholders. Therefore there is a need for more detailed knowledge on use and users of the national parks.

This new “verbal/political integration” of tourism and national park management is also the main reason for another newly established working group on nature tourism in DN. The goal for this group and new working arena is:

“… to contribute to an increase and improvement of tourism industry use of Norwegian nature and cultural landscape in general, and of the great conservation areas in particular, through clarifying the frames and possibilities for development, with a focus on the responsibility to secure biodiversity and ‘friluftsliv’ based on Every man’s right.”

To improve the knowledge on both ecological and social conditions in and around the parks (“carrying capacity judgements”) is one of the tasks.

### 4.6 Visitor monitoring in Sweden

*Peter Fredman*
Mid-Sweden University

Visitor monitoring typically includes both counting the number of people visiting a specific areas and surveying their characteristics, attitudes and behavior. The latter may comprise activity participation, visitor patterns (space, time), socioeconomic descriptions, motivations, experiences, benefits, ecological-, economic- and social impacts. While counting the number of visitors is usually carried out on site, visitor surveys can be performed as on site surveys or as general population surveys. In Sweden, the different approaches have been used in several studies in various natural-geographical regions, but with little attempt to establish a standardized methodology. Many studies have been done as part of university research projects, but recent changes in Swedish environmental policy emphasize the need for visitor monitoring in natural resource management and protection.

#### 4.6.1 General population studies

Statistics Sweden collects information on outdoor recreation participation as part of the national census – “Undersökningar av levnadsförhållanden,
监测户外娱乐在北欧和波罗的海国家

ULF” (Statistics Sweden 2004). This has been done in 1976, 1982–83, 1990–91 and 1999. These surveys will not give a complete overview of outdoor recreation in Swedish society, but rather describe participation in a selection of activities and variations in participation among different groups. A sample of the Swedish population (7,000 interviews) was each time asked about participation in walking, forest hiking, gardening, outdoor swimming, boating, fishing, mountain backpacking and hunting. Data has been analyzed with regard to socioeconomic groups as well as trends over time. Measures of these activities show that outdoor recreation is increasing in Sweden, but primarily among older and middle aged individuals, while it is decreasing among younger individuals. The surveys also show that non-native Swedes are participating less in outdoor recreation and that people living in the north of Sweden are participating more frequently.

General population surveys have also been done with the focus on mountain tourism, forest recreation and visits to protected areas. A study of mountain tourism in 1999 collected data in two phases; 1) a telephone survey to identify visitors and non-visitors to the Swedish mountain region followed by, 2) mailed surveys to collect additional information about the trips reported in the telephone survey (Heberlein et al. 2002). The sampling frame was all households in Sweden outside the mountain region with a registered household telephone. Following the telephone survey, a questionnaire was mailed to both mountain visitors and non-visitors who gave their name and address in the telephone survey. The survey contained a general section which applied to all respondents as well as special sections that applied to those who participated in specific activities. This study also repeated a survey by the Swedish Environmental Protection Agency in the mid 1980s, and includes information on changes in mountain tourism (Fredman & Heberlein 2003).

Surveys on forest recreation have studied different forest characteristics vis-à-vis outdoor recreation and the distance to the closest recreational forest (Hörnsten 2000). Both are based on mailed surveys to samples of the national adult population in the range of 1000–3000 individuals. Studies of visits to protected areas have focused on national parks in the mountain region and nature reserves in the Stockholm area. Visitations to national parks in the mountain region was studied by means of a mailed questionnaire sent to 11,400 Swedish citizens (Fredman & Sandell 2005). This survey also covered several topics related to sustainable use of the region including fish, wildlife, land management and future participation in outdoor recreation activities. The Stockholm County Board surveyed 1000 citizens in the county with respect to the use of nature reserves (Länsstyrelsen i Stockholms län, 2004).
4.6.2 Onsite studies

Quite a large number of onsite visitor surveys have been made in Sweden, often included in university research projects. Different outdoor recreation settings have been subject to these studies. However, the focus has often been on close to urban nature, forest, mountain and coastal areas (Table 1, Appendix 5). Notably, some of these studies have monitored outdoor recreation over time, while only one of them surveys winter based outdoor recreation activities (snowmobiling and cross-country skiing). All these studies represent large variations in methodology and quality, which clearly indicates a need for improved standards. Besides collecting visitor data, some of these studies have also focused on visitor monitoring method development. Current knowledge in this respect has been summarized in two recent publications – a manual of visitor studies in nature areas produced by the National Board of Forestry (Lindhagen & Ahlström 2005) and a guide to visitor counting published by the Swedish Environmental Protection Agency (Naturvårdsverket 2005a, 2005b).

The report by the National Board of Forestry is a guidebook to both visitor counting and the use of interviews and questionnaires, including guidelines to various calculation methods. It was produced as part of the EU Life project “Urban woods for people”. Many of the cases and methods reported in this guidebook are based on the research done by Kardell and Lindhagen (See Table 1).

The publication by the Swedish Environmental Protection Agency is a comprehensive report on the use of the electronic “Radio Beam” visitor counter. The agency has been conducting a project on counting outdoor recreation since the late 1990s which has included the studying and testing of various types of visitor counting equipment. Onsite studies done by Fredman et al. (2005), Hultman & Wallsten (1988), Emmelin & Ohlsson (1999), Vuorio (2003) and Wall (2004) have all utilized the “Radio Beam” visitor counting methodology, primarily in mountainous settings.

Another recent project aiming at the development of visitor monitoring methods focused on visitors to Fulufjället National Park in Sweden. In the year before and the year after National Park designation, extensive visitor surveys were conducted to guide the park management plan and further development, as well as to monitor changes in visitor characteristics, activities and impacts (Fredman et al. 2005). Both surveys used onsite counters (Radio Beam), self registration boxes and follow up mailed questionnaires to collect visitor data.
### Table 1: A selection of Swedish onsite visitor studies

<table>
<thead>
<tr>
<th>Study area</th>
<th>Author(s)</th>
<th>Method</th>
<th>Longitudinal</th>
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<tr>
<td><strong>Forest Based Recreation</strong></td>
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<tr>
<td>Campers in Småland and Norrbotten</td>
<td>Bostedt &amp; Mattsson (1990)</td>
<td>Onsite questionnaires</td>
<td></td>
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<tr>
<td>Tyreska National Park (urban forest)</td>
<td>Fredman &amp; Hansson (2003)</td>
<td>Onsite interviews</td>
<td></td>
</tr>
<tr>
<td>Djurgården (urban park / forest)</td>
<td>Kardell (1998)</td>
<td>Direct observation Onsite interviews</td>
<td></td>
</tr>
<tr>
<td>Växjö urban forests</td>
<td>Kardell &amp; Lindhagen (1995)</td>
<td>Direct observation Telephone interviews Onsite interviews</td>
<td></td>
</tr>
<tr>
<td>Nature reserves in Stockholm region (urban forest)</td>
<td>Lännsstyrelsen i Stockholms län (2003)</td>
<td>Onsite questionnaires Personal interviews</td>
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<tr>
<td><strong>Mountain Based Recreation</strong></td>
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<tr>
<td>Södra Jämtlandsfjällen</td>
<td>Vuorio (2003)</td>
<td>Onsite registration cards Follow up mailed surveys</td>
<td></td>
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<tr>
<td>Mittäläppen</td>
<td>Emmelin &amp; Iderot (1999)</td>
<td>Onsite interviews</td>
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<tr>
<td><strong>Water Based Recreation</strong></td>
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<tr>
<td>Fishing in Byskeälven</td>
<td>Appelblad (2001)</td>
<td>Mailed questionnaire</td>
<td></td>
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<tr>
<td>Luleå skärgård (archipelago)</td>
<td>Ankre (2005)</td>
<td>Onsite registration cards Mailed questionnaire</td>
<td></td>
</tr>
</tbody>
</table>

**4.6.3 The current status of visitor monitoring in Sweden**

To succeed in adequately managing and developing natural areas with respect to ecological, social and economic values, it is crucial to collect relevant and accurate data on visitor numbers and characteristics. The
reasons for visiting natural areas are often just as diversified as the visitors. Outdoor recreation participation takes many different forms, at different places during different seasons of the year, and studies of outdoor recreation in a changing society call for good data that captures the core elements of activity participation, use patterns, attitudes, constraints, social and economic values and impacts. Although with a population of only 9 million, Sweden has a lot of diversity in several perspectives. It stretches 1500 kilometres north-south – including the alpine tundra, sub-alpine wooded tundra, the boreal taiga, as well as the cool mixed and temperate forests of the south. There are 90,000 lakes, 2000 kilometres of coastline, and one third of the country is part of the mountain region which stretches over 1,000 km in the northwest along the Norwegian border. The mountain municipalities make up about one third of Sweden but include fewer than two percent of the total population. Population changes during the last few decades show increased urbanization, 90 percent of the population live in the southern third of the country, and an increasing proportion of the population are immigrants.

Outdoor recreation visitor information is needed for area management, tourism development and regional planning in order to estimate recreation demand and supply, manage conflicts, provide a spectrum of recreation opportunities, monitor visitor impact, etc. Perhaps partly due to the great diversity in the Swedish natural and social contexts, data on outdoor recreation in Sweden has been collected in different research projects using different methodologies. Moreover, the official statistics include only a limited number of all outdoor recreation parameters (Statistics Sweden 2004), which limit the possibilities to study recent changes and the broader scope of outdoor recreation.

There is, however, a growing interest among several Swedish authorities and organizations dealing with management of natural areas towards collecting better information on outdoor recreation. This includes, among others, the Swedish Environmental Protection Agency, The National Board of Forestry, the state owned forest company Sveaskog, Regional county boards and municipalities.

Recent changes in Swedish environmental policy imply increased recognition of social and economic values in environmental protection in general and protected areas in particular (Swedish Government Writ 2001/02:173). Key components in this process are local participation, regional development (e.g. tourism) and recognition of outdoor recreation benefits (e.g. health, environmental education etc.). Accordingly, the Swedish Environmental Protection Agency is currently implementing several visitor monitoring projects, many of which are related to protected areas.

The current Swedish forestry policy is under review and social values associated with forests will most likely be increasingly important. A lot of focus is on forests close to urban areas where visitation rates are often
considerably more intense than in more distant natural areas. The EU Life project “Urban woods for people” (see above) has been managed by the national Board of Forestry. Sveaskog will develop nature based tourism on public land in the north of Sweden and is establishing special “ecoparks” with the focus on multiple use forestry practices. Ecotourism is also being used to market Sweden abroad as a tourist destination. These initiatives have to some extent, and will even more so in the future, increase the demand for visitor monitoring in Sweden.

Besides its usefulness as a data source in various research projects, information from visitor monitoring should ultimately improve environmental policy and management. One example in this respect is the visitor surveys undertaken at Fulufjället National Park. In this case, data from the survey done the year before park designation was used to design the management plan of the National Park with respect to zoning of recreation facilities, rules and regulations, etc. The second survey, one year after park designation, was then used as a short term follow up of the management plan and a tool for monitoring changes in park visitation. Another example is the study of recreation conflicts between snowmobilers and cross-country skiers in the Jämtland region (Lindberg et al. 2001) which has been used by the regional county board as an input in their decisions on trail separation in the area. The study by Vuorio (2003) was used as an input in the local planning process by the Åre and Bergs municipalities for the Southern Jämtland Mountain Region. Studies by Kardell and Lindhagen (Table 1) have in several ways had an impact on close to urban forest practices as well as the designation of outdoor recreation facilities.

A strong signal from the political level is the current mission from the government to the Swedish Environmental Protection Agency to produce “a programme to produce relevant statistics about outdoor recreation in Sweden”.

4.6.4 Conclusions

In Sweden, there are several examples of visitor monitoring from the last 20 years. Many of these studies have been done as part of university research projects with little or no co-ordination between them. General population surveys have been done with the focus on mountain tourism, forest recreation and visits to protected areas. Onsite visitor surveys have focused on close to urban nature, forests, mountain recreation and coastal activities. Notably, some of these studies have monitored outdoor recreation over time, while only one example of winter based outdoor recreation exists. All these studies represent large variations in methodology and quality. Besides collecting visitor data, some of these studies have also focused on visitor monitoring method development. Current knowledge in this respect has been summarized in two recent publications – a
guide to visitor studies in nature areas produced by the National Board of Forestry and a manual to visitor counting by the Radio Beam method produced by the Swedish Environmental Protection Agency. The need to establish a standardized methodology in Sweden has recently been recognized, partly due to changes in the environmental policy that implies an increased recognition of social and economic values in environmental protection. There are some good examples of information from visitor monitoring being used in natural resource policy and management, like the designation process of Fulufjället National Park.

The strength of visitor monitoring in Sweden includes method development, particularly for onsite approaches and an increasing awareness of the advantages of visitor data for planning and management. Among the weaknesses is a poorly developed system for national monitoring of outdoor recreation. The use of visitor information in management decisions can be improved.
5. Conclusions

5.1 Summary and evaluation of the current situation

The state of the art reports and case studies presented in chapter 4 and in the appendices indicate that visitor monitoring is considered of growing importance in the Nordic and Baltic countries. There has been quite a bit of monitoring going on, both at population level and on site, in some countries for several decades. Consequently, methodological development has also been proceeding for a long time.

The state of the art reports and case studies indicate that there is a wide range of methodology available, as different countries have taken somewhat different approaches to visitor monitoring. This has been influenced by different land ownership and management situations. Some countries have placed relatively more focus on urban forests, while others have been focusing more on remote protected or recreational areas. Together, this Nordic-Baltic experience forms a large knowledge-base on applicable methodology in various situations.

The drawback of having used a wide range of methodology even within each country is that there is no comparable data in most of the cases. The lack of national monitoring guidelines was recognized as one of the main deficiencies in most of the country reports. It was noted that for biological and production monitoring national monitoring systems have been established, but for social monitoring the situation is much less developed. Finland is the only country in this project where a national visitor monitoring system is already established, and even there it is systematically applied only on state-owned protected and recreational areas. In Estonia, visitor monitoring is conducted systematically and on the same basis in all recreational areas in state forests. In Denmark, some uniform national surveys and long-term monitoring has been accomplished, but so far these are not part of a more permanent, official monitoring system. However, the situation seems to be changing; many of the state of the art reports note that in the national policy guidelines there is a growing interest and need toward developing a national visitor monitoring programme that would yield comparable long-term data. At the same time, in most of the countries there seems to be increasing awareness of the advantages of visitor data for planning and management.

The brief review on existing handbooks (chapter 3) shows that there are some handbooks on visitor monitoring available. Most of them, however, come from countries other than Nordic or Baltic ones, particularly from the United States, Canada and the United Kingdom. Because Nordic and Baltic countries have some special circumstances, especially the tra-
ditional right of common access, the methodological know-how is not directly transferable to Nordic and Baltic countries. Finland and Sweden make an exception; they have produced handbooks on both visitor counting and visitor surveys, and because these handbooks have been developed for Scandinavian circumstances, they include material more directly applicable to a handbook that would cover Nordic and Baltic countries.

The analysis of existing practices and guidelines has shown that for various reasons there is a broad range of methodology currently being applied. This knowledge forms a good starting point for developing methods for different kinds of settings, because Nordic and Baltic countries are not homogenous either, and different methods are applicable to different types of areas, e.g. on a scale from urban to rural settings.

5.2 Future development needs

From the country reports, it is evident that there is a need and interest for standardized information on visitors across the Nordic and Baltic countries. This information would be valuable for local, regional, national and international purposes. The harmonization of single studies is not only for the benefit of national and international comparisons. It also adds value to the single study itself, allowing for comparisons with other single studies or a national or international situation.

The case studies indicate that there are certain commonalities in variables that are important in all the Nordic and Baltic countries, regardless of the circumstances, that could be standardized. This requires developing standardised core questions, i.e. questions that would be common and measured in the same way in all the countries.

The way to put the standardised methods into practice is to create a manual applicable to Nordic and Baltic circumstances, for which there is a clear need. In addition to standardised methods, another important issue that should be included in the manual is the terminology in all the languages of the project. Jointly agreed terminology would help to create a common understanding in the field in the future. This way, eventually, the Nordic and Baltic countries would start to obtain uniform visitor monitoring information, creating a common basis for visitor information statistics and databases in these countries.
References

This list of references has been arranged by participating countries. References that come from other than Nordic or Baltic countries, and references that cover several countries, are found under the subheading “Other countries or publications related to several countries”.

Denmark


Estonia


Finland


Norway


Sweden


---

**Other countries or publications related to several countries**


ISBN: 2-8317-0476-6


The Visitor Services Project. Social Science Program, USDI Department of the Interior, National Park Service / Park Studies Unit, College of Natural Resources, University of Idaho. A brochure. Available at: [www.psu.uidaho.edu](http://www.psu.uidaho.edu)


Sammanfattning

Projektets syfte var att utveckla metoder för besökarstudier för nordiska och baltiska markförvaltande myndigheter vars arbete omfattar hantering av besökare i skyddade områden och områden för friluftsliv. Projektets främsta verksamhet var att skapa en grund för vidare utveckling av metoder för besökarstudier i skyddade områden och områden för friluftsliv.

Projektet har omfattat utbyte av erfarenheter mellan de deltagande länderna, insamling av material och fallstudier, översättning av tillämpliga delar av de två befintliga finska handböckerna om besökarstudier samt sammanställning av en slutrapport baserad på allt detta arbetsmaterial. Projektet har byggt på flera informationskällor, bland annat tankar som utvecklats under seminariet "Nordic-Baltic Workshop on Visitor Information Needs and Monitoring Methods" som anordnades i juni 2004 i Rovaniemi, Finland.


Projektet har möjliggjorts genom finansiering från Nordiska ministerrådet och svenska Naturvårdsverket.
Appendices:
Country specific case studies
Monitoring outdoor recreation in the Nordic and Baltic countries
Appendix 1: Denmark

1.1 Visitor survey, Case 1: Specific forest/nature areas – exemplified by Jægersborg Dyrehave

Frank Søndergaard Jensen
Danish Centre for Forest, Landscape and Planning, KVL

A number of specific sites have been surveyed by the methodology described below. To keep the description simple, only one area is described as a “model-area”.

A short description of the characteristics of the area
Jægersborg Dyrehave (Deer Park) is a well-known outdoor recreation area situated approximately 10 km north of Copenhagen. The area is an open plain landscape with scattered groups of broad-leaved woods. For centuries it has been the outdoor recreation area for the citizens of Copenhagen. The area has a large stock of e.g. red deer.

Why the study was implemented, for whom are the results collected?
The study was implemented to get a better knowledge of the total use of the area. This basic knowledge is the basis for taking recreational considerations in the planning and management of the area.

Who implemented the study?
Researchers implemented the study. Natural resources students accomplished the fieldwork for collecting data.

Staff requirements (skills, number of employees, working time)
As students accomplished the fieldwork, they possessed the needed skills. Thorough instruction was given before the data collection was initiated.

Costs
The cost of the fieldwork was approximately 220 hours. In addition comes data punching and analysis.

A short description of sampling methodology
The registration periods and registration places have been selected by stratified random sampling.

The registration was carried out on 20 stratified randomly selected days each of a period of 8 hours during one year. The stratification took the seasonally, weekly and daily variation into account
(e.g. there are more registrations accomplished during summertime compared with wintertime, and more registrations in the middle of the day compared with mornings and evenings).

As registration places, all exits from the forest have been used (stratified on the basis of the expected use of the given exit/entrance – this information was obtained in close co-operation with the local manager).

The interview was combined with manual counting as well. Each manual counting lasted 15 minutes. At each counting one person was sampled for interviewing among everybody who was judged older than 15 years in the first registered group. No more than one interview was carried out per 15 minute counting, even in the case of a non-response interview.

Between each counting, 15 minutes were set aside for transportation to the next registration place. This methodology means a total of 320 counting/interviewing periods distributed over one year, resulting in contact with 320 interviewees at maximum.

Enumeration to annual figures based on the sampling is completed by sample estimation (weighting). The counting data can also be included in a multiple linear regression model with the four permanent counting stations (see e.g. “Visitor counting – Denmark (1) Permanent automatic counting – car-borne forest visitors”).

**Was the sampling done year round or if not, which season(s)?**
The sampling was done year round in 1977–78

**Number of people contacted and response rate**
285 persons above 15 years were contacted (out of a maximum of 320, i.e. at 35 registration intervals of 15 minutes no (or no valid) interviewee was available, cf. above). Response rate: 84%

**Ways in which the data was collected**
On-site guided interviews (questionnaires). The interviewer who also filled in the answers read the questions. When a question proposed a number of alternatives for answers, the interviewee was handed a small laminated card with the alternatives to facilitate the answering.

**Listing which variables were collected for monitoring and which ones for research or other purposes**

**List of variables studied**
See the attached interviewing form.
How has the information been used or is being used?
The collected information is used as the basic knowledge for taking recreational considerations in the planning and management of the area. For example, in the forest area “Gl. Kjøgegaard”, where the same methodology was used, the results gave cause for as much closing down as establishing a number of paths.

Evaluation of the successfulness of the study: strengths and weaknesses?
Strengths: Based on a relatively manageable fieldwork effort, detailed information regarding the use and preferences are obtained. Weaknesses: Calculation of confidence intervals is impossible due to the sampling design.

Level of the monitoring programme on a scale by Hornback and Eagles 1999?
–

Recommendations for the next time, if somebody was to implement this study in a similar kind of setting
–

Reference
See Koch (1984) for results. The main text is in Danish, but summary, tables and figures are in English. Other surveys using the same methodology can be found by Jensen (1992) and Jensen & Guldager (2005) – in Danish only.
### 1.3 Interview-skema nr. 2 (størrelse: 1:2.5):

**Interviewing form No. 2 (size: 1:2.5):**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. WHICH FOREST ENVIRONMENT DO YOU PREFER TO VISIT?</td>
<td>1 or 2 or don't mind? etc.</td>
</tr>
<tr>
<td>2. WHAT HAVE YOU BEEN DOING IN CONNECTION WITH YOUR VISIT HERE? (Show card A)</td>
<td>1) Enjoying nature; 2) Sightseeing; 3) Walking; 4) Driving; 5) Exercising; 6) Walking the dog; 7) Studying nature; 8) Playing golf; 9) Riding; 10) Visiting a restaurant; 11) Working; 12) Visiting the beach; 13) Other activity;</td>
</tr>
<tr>
<td>3. WHAT WAS THE LENGTH OF STAY TODAY?</td>
<td>9) less than 5 minutes; 10) quarter of an hour; 11) half an hour; 12) one hour; 13) 2 to 3 hours; 14) 5 to 8 hours; 15) more than 8 hours; 16) don't know.</td>
</tr>
<tr>
<td>4. HOW LONG DID THE ACTUAL JOURNEY TO THE FOREST AREA TAKE?</td>
<td>1) less than 5 minutes; 2) 5 to 10 minutes; 3) 10 to 15 minutes; 4) half an hour; 5) three quarters to an hour; 6) an hour and a half; 7) more than 1½ hours.</td>
</tr>
<tr>
<td>5. WHICH MEANS OF TRANSPORT DID YOU USE ON THE ACTUAL JOURNEY TO THE FOREST AREA? (If more than one, tick the one used on the longest stretch).</td>
<td>1) On foot; 2) Horse; 3) Bicycle; 4) Moped; 5) Motorbike/scooter; 6) Car; 7) Bus; 8) Train/lake;</td>
</tr>
<tr>
<td>6. WHERE DID YOU START FROM?</td>
<td>(Only street name accessible)</td>
</tr>
<tr>
<td>7. WHAT WAS THE DISTANCE FROM YOUR STARTING POINT TO THIS FOREST AREA?</td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Variable</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. ARE YOU ON HOLIDAY AT THE MOMENT?</td>
<td>1) Yes; 2) No.</td>
</tr>
<tr>
<td>9. WHEN DID YOU LAST VISIT THIS FOREST AREA?</td>
<td>1) Have not visited recently; 2) Less than 1 week ago; 3) 1 to 2 weeks ago; 4) 2 to 3 weeks ago; 5) 4 to 6 weeks ago; 6) 6 to 10 weeks ago; 7) More than 1 year ago; 8) Don't remember/don't know.</td>
</tr>
</tbody>
</table>

---

**NB:** Picture folder No. 1 or 2...
TRANSLATION:

10. THIS CARD SHOWS WHAT IS CHARACTERISTIC FOR THE FOREST AREA JÆGERSBORG DYTREHAVE. (Show card B). HOW IMPORTANT ARE THESE THINGS TO YOU?

A) Important to me. 
B) Not important to me. 
C) I don’t know.

11. ON YOUR VISIT IN THIS AREA TODAY, DID YOU FEEL INCONVENIENCED BY THERE BEING: 

A) TOO MANY PEOPLE B) TOO FEW PEOPLE C) About right 
D) I don’t know.

12. IS THIS THE FIRST TIME IN CONNECTION WITH THIS VISIT THAT YOU WALK OUT OF ONE OF “DYTERHAVE’s” RED GATES — YES IF NO, HOW MANY TIMES PREVIOUSLY?

13. AND FINALLY, SEX, AGE AND OCCUPATION FOR EACH MEMBER OF THE GROUP:

SEX: (1) Male; (2) Female.

AGE: (0) 0—5 years; (1) 5—10 years; (2) 10—15 years; (3) 15—20 years; (4) 21—30 years; (5) 30—40 years; (6) 40—50 years; (7) 50—60 years; (8) 60 years or more.

OCCUPATION: (01) Self-employed farmer; (02) Self-employed other; (03) Wife assisting either of the above; (04) Skilled worker (incl. apprentices); (05) Unskilled worker; (06) Civil servant; (07) Business; (08) School child; (09) Child under school age; (10) Pensioner; (11) Housewife; (12) Other (state what).
1.2 Visitor survey, Case 2: National visitor survey

Frank Søndergaard Jensen  
Danish Centre for Forest, Landscape and Planning, KVL

Two “national” visitor surveys have been accomplished in 1976/77 and 1996/97.

The visitor counting, described under the heading “Visitor Counting Case 2: National counting survey”, was done at the same time as the visitor survey described here.

A short description of the characteristics of the area

In 1976/77 446 forests (with a total of 187,000 ha) and in 1996/97 592 forests/nature areas (with a total of 201,000 ha – 174,000 ha forest) were monitored.

Why the study was implemented, for whom are the results collected?

The study was implemented to describe the geographical variation in a number of descriptive data for the actual use of the specific area – to be used in the local planning and management of the area.

The study in 1996/97 was initiated to update the 20-year-old material, looking at trends for the repeated monitored areas. A number of new variables were included regarding e.g. crowding and visitor conflicts as well as the use of, and attitudes regarding, the supply of recreational facilities. In addition, nature areas other than forests were included.

Who implemented the study?

Researchers implemented the study. Local management staff accomplished the fieldwork for collecting data.

Staff requirements (skills, number of employees, working time)

Thorough written instructions were given before the data collection was initiated. The fieldwork was organised in such a way that all places where forest visitors could park their car (at a given forest/nature area) could be inventoried during 1 hour. The staff used varied from forest supervisors to forest workers.

On average about 75 hours total work of the local managers was required for each area. (This includes the visitor survey as well as the simultaneous visitor counting).

Costs

In addition to the field costs (which were covered by the specific local area), the preparation, organisation, management, analysis etc. which was done by the Danish Centre for Forest, Landscape and...
Planning, KVL amounted to around 450,000 Euros. (This includes the visitor survey as well as the simultaneous visitor counting).

A short description of sampling methodology
The registration periods have been selected by stratified random sampling. The registration was carried out at 20 stratified randomly selected moments of max. 1 hour and at 2 subjectively selected times at peak use. The stratification took the seasonal, weekly and daily variation into account (e.g. there are more registrations accomplished during summertime compared with wintertime, and more registrations in the middle of the day compared with mornings and evenings).

As registration places, all places where cars can be parked in relation to forest visits were covered (parking lots, roadsides etc.) – the registration places were selected by the local manager.

Enumeration to annual figures based on the sampling is completed by sample estimation (weighting).

Was the sampling done year round or if not, which season(s)?
The sampling was done year round in 1976–77 and 1996/97

Number of people contacted and response rate
In 1976–77 44,846 questionnaires was delivered – response rate: 53.7 %
In 1996/97 85,673 questionnaires was delivered – response rate: 46.7 %
(Not possible to make contact for follow-ups).

Ways in which the data was collected
At each parked car a relatively short questionnaire (packed in a plastic bag) together with a pre-paid return envelope was placed on the windscreen.

List of variables studied
See the attached interviewing form. In addition to the questions shown in the form, a number of additional questions were asked in 1996/97: Time spent in different nature types (e.g. forest, lake, beach etc.), observed and used recreation facilities, attitude to the amount of facilities, walking outside roads/paths, experience of crowding, troubles with other visitors, knowledge about the existence area and ownership/administration of the area.

Listing which variables were collected for monitoring and which ones for research or other purposes
–
How has the information been used or is being used?
The collected information is being used as the basic knowledge for taking recreational considerations in the planning and management of the specific area into account. For the forests (a total of 301 areas) which participated in both surveys the information has been used in establishing trends in the development of the use pattern over the 20-year period.

Evaluation of the successfulness of the study: strengths and weaknesses?
Strengths: Based on a relatively manageable fieldwork effort, detailed information regarding the use and preferences are obtained at the same time for a large number of forest/nature areas.

Weaknesses: Only the recreational use of the car-borne visitors is included in the survey. The main input at the Danish Centre for Forest, Landscape and Planning, KVL, for managing and analysing the many areas and data is relatively costly and time consuming.

Level of the monitoring programme on a scale by Hornback and Eagles 1999?

Recommendations for the next time, if somebody was to implement this study in a similar kind of setting

Reference
See Koch (1980) for results from the 1976/77 survey. The main text is in Danish, but summary, tables and figures are in English. Results from the 1996/97 survey can be found by Jensen (2003) – in Danish only.
1.4 Spergeskema (størrelse: 1:2):

**Questionnaire (size: 1:2):**

![Questionnaire Image]

**Translation:**

Project "Forest and Folk"
The Danish Forest Experiment Station
Springforbigade 4, 2930 København

**Danish Forestry** is in the process of conducting a poll among its visitors in an attempt to develop the Danish forests according to their wishes. We kindly request you to help us by completing the following questionnaire—even if you have not been in the forest, and even if you may have answered similar questions before during an earlier visit.

The questionnaire is also a lottery ticket! As a thank you for your trouble you will take part in a lottery for:

- 3 prizes of 3,600 kr. cash

You need only to send in the completed questionnaire in the envelope provided (postage paid).

You keep the attached lottery ticket.

The results of this poll depend upon all questionnaires being returned.

**Your reply** is as important as all the others so please complete the questionnaire and post it, preferable today.

The replies will ONLY be used in statistical tables with the purpose of producing the basis for developing the Danish forests for your benefit.

Thank you in advance for your help.

Yours sincerely,

Erik Holmgaard (Director, The Danish Forest Experiment Station)  
Niels Elers Koch (Project leader)
### Monitoring outdoor recreation in the Nordic and Baltic countries

#### Spørgeskemaets side 2: Questionnaire, p. 2:

<table>
<thead>
<tr>
<th>1. HAR DE VÆRET PÅ TUR I DETTE SKOVOMRÅDE I DAG, ELLER HAR DE HINDT HER AF ANDRE GRUNDE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ja/nej)</td>
</tr>
<tr>
<td>Ja, har været på tur i skovområdet i dag</td>
</tr>
<tr>
<td>Nej, har holdt her af andre grunde</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. HVORDRIS MED NI DE BESTEMTE OMråDER I FORBINDELSE MED BESIGT HERR</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ikke voks — gerne mere end 1)</td>
</tr>
<tr>
<td>Oplev natur</td>
</tr>
<tr>
<td>Slidde stil</td>
</tr>
<tr>
<td>Grillen tur</td>
</tr>
<tr>
<td>Kort en tur</td>
</tr>
<tr>
<td>Mindre varslet</td>
</tr>
<tr>
<td>Luftet hand</td>
</tr>
<tr>
<td>Studeret natur</td>
</tr>
<tr>
<td>Været ude i ride</td>
</tr>
<tr>
<td>Været på legi</td>
</tr>
<tr>
<td>Været ude i fiske</td>
</tr>
<tr>
<td>Været i arbejde</td>
</tr>
<tr>
<td>Været ved stranden</td>
</tr>
<tr>
<td>Andre</td>
</tr>
<tr>
<td>Hvis andet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. HVORDRIS VÆREDE DERES BESIGT I DAG?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ikke voks)</td>
</tr>
<tr>
<td>Mindre end 5 minutter</td>
</tr>
<tr>
<td>Et kvarters tid</td>
</tr>
<tr>
<td>1½ timer tid</td>
</tr>
<tr>
<td>Et par timer tid</td>
</tr>
<tr>
<td>3 til 4 timer</td>
</tr>
<tr>
<td>5 til 8 timer</td>
</tr>
<tr>
<td>mere end 8 timer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. HVOR LANG TID BRUGTE DE I DAG PÅ SELVE BESIGTEN UD TIL SKOVOMRÅDET?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ikke voks)</td>
</tr>
<tr>
<td>Mindre end 2 timer</td>
</tr>
<tr>
<td>2 til 5 timer</td>
</tr>
<tr>
<td>5 til 10 timer</td>
</tr>
<tr>
<td>Efter kvarters tid</td>
</tr>
<tr>
<td>En halv time tid</td>
</tr>
<tr>
<td>tre kvarters til en time</td>
</tr>
<tr>
<td>½ timer tid</td>
</tr>
<tr>
<td>mere end ½ time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. HVORDRIS MILLIONER KORTE DE PÅ TURSTEN? (skriv omtrentlige antal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>km</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. HVORDRIS DU FRA?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(km godsmænd med selverdi)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. ER DE PÅ FERIE FOR ØJEBlikket?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ja/nej)</td>
</tr>
<tr>
<td>Ja</td>
</tr>
<tr>
<td>Nej</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. HVORDRIS OPHOLDT DE DEM SISTE GANG I DETTE SKOVOMRÅDE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ikke voks)</td>
</tr>
<tr>
<td>Har aldrig besigtet det før</td>
</tr>
<tr>
<td>Før mindre end 1 uge siden</td>
</tr>
<tr>
<td>Før 1 til 2 uger siden</td>
</tr>
<tr>
<td>Før 2 til 4 uger siden</td>
</tr>
<tr>
<td>Før 2 til 4 måneder siden</td>
</tr>
<tr>
<td>Før 4 til 12 måneder siden</td>
</tr>
<tr>
<td>Før mere end 1 år siden</td>
</tr>
</tbody>
</table>

### Translation:

1. **HAVE YOU BEEN VISITING THIS FOREST AREA TODAY, OR HAVE YOU STOPPED HERE FOR OTHER REASONS?**
   - (Tick box) (1) **YES**, have been visiting this forest area today; (2) **NO**, have stopped here for other reasons.

2. **WHAT HAVE YOU BEEN DOING IN CONNECTION WITH YOUR VISIT HERE?**
   - (Tick box(es) — please more than one if you wish)
     - (10) Enjoing nature;
     - (11) Sitting still;
     - (12) Walking;
     - (13) Driving;
     - (14) Exercising;
     - (15) Walking the dog;
     - (16) Studying nature;
     - (17) Riding;
     - (18) Hunting;
     - (19) Fishing;
     - (20) Working;
     - (21) Visiting the beach;
     - (22) Other activity;

IF OTHER ACTIVITY:
   - Please state:

3. **WHAT WAS THE LENGTH OF STAY TODAY?**
   - (Tick box) (1) less than 5 minutes; (2) a quarter of an hour; (3) half an hour; (4) one hour; (5) a couple of hours; (6) 3 to 4 hours; (7) 5 to 8 hours; (8) more than 8 hours.

4. **HOW LONG DID THE ACTUAL CAR JOURNEY TO THE FOREST AREA TAKE TODAY?**
   - (Tick box) (1) less than 2 minutes; (2) 2 to 5 minutes; (3) 5 to 10 minutes; (4) quarter of an hour; (5) half an hour; (6) three quarters to an hour; (7) an hour and a half; (8) more than 1½ hours.

5. **HOW MANY KILOMETRES DID YOU DRIVE TO THE FOREST?**
   - (Fill in approximate number)
   - km

6. **WHERE DID YOU START FROM?**
   - (Street name only)
   - (Post code)
   - (Town)

7. **ARE YOU ON HOLIDAY AT THE MOMENT?**
   - (Tick box) (1) **YES**; (2) **NO**.

8. **WHEN DID YOU LAST VISIT THIS FOREST AREA?**
   - (Tick box) (6) Have not visited it before; (1) Less than 1 week ago; (2) 1 to 2 weeks ago; (3) 2 to 4 weeks ago; (4) 1 to 2 months ago; (5) 2 to 3 months ago; (6) 4 to 12 months ago; (7) More than 1 year ago.
9. **HOW MANY PEOPLE WERE IN YOUR CAR WHEN YOU REACHED THE FOREST AREA TODAY?**

   (write number) ____________________

10. **WOULD YOU PLEASE FILL IN THE CHART BELOW GIVING AGE, SEX AND OCCUPATION FOR EACH PERSON IN THE CAR — BOTH ADULTS AND CHILDREN:**

   (tick appropriate box) (coach parties not to complete this section)

   **SEX**
   (1) Male; (2) Female.

   **AGE**
   (0) 0—2 years; (1) 3—6 years; (2) 7—13 years; (3) 14—16 years; (4) 17—20 years; (5) 21—40 years; (6) 41—60 years; (7) 61—80 years; (8) more than 80 years.

   **OCCUPATION**
   (01) Self-employed farmer; (02) Self-employed — other; (03) Wife assisting either of the above; (04) Skilled worker (incl. apprentices); (05) Unskilled worker; (06) Civil servant/salaried staff; (07) Student; (08) School child; (09) Child under school age; (11) Pensioner; (12) Housewife; (13) Other (state what).
Questions:

11. IF YOU HAVE OTHER COMMENTS OR SUGGESTIONS PLEASE WRITE THEM HERE:

THANK YOU FOR YOUR HELP.
REMEMBER THE LOTTERY TICKET AND TAKE THE PLASTIC FOLDER WITH YOU
DON'T LEAVE IT AS LITTER.
WE WISH YOU A GOOD JOURNEY HOME.
1.3 Visitor survey, Case 3: The Gudenaa River Survey

Frank Søndergaard Jensen  
Danish Centre for Forest, Landscape and Planning, KVL

A short description of the characteristics of the area  
The Gudenaa River in Jutland is the largest river in Denmark. It is 160 km long, of which 150 km is passable by canoe or kayak. The navigation is regulated to a specific number of boats. If one is not living in the local municipalities along the river, a permit is required from the county to sail on the river. The number of commercial outfitters – and their number of boats – is also restricted through the regulations.

Why the study was implemented, for whom are the results collected?  
The study was implemented to get a better knowledge of the satisfaction of the canoeists sailing on the river – does the regulation of the number of boats fulfil their goals – any crowding problems?

Who implemented the study?  
Researchers implemented the study as part of a larger cross-scientific research programme. Natural resources students accomplished the fieldwork for collecting data.

Staff requirements (skills, number of employees, working time)  
Students accomplished the fieldwork and they possessed the necessary skills. Thorough instructions were given before the data collection was initiated. The fieldwork took place over 3 weeks.

Costs  
The cost of the fieldwork was approximately 220 hours. In addition comes travelling expenses and expenses in relation to data punching and analysis.

A short description of sampling methodology  
Two different data collections took place:

1. In connection with the portage at a hydro-electric power station (Tangeværket) all canoeists were asked to fill in a brief questionnaire onsite, and they received a larger questionnaire at home when returning from the trip on the river. This data collection took place during one week in the high season.
2. At the starting point (Silkeborg) for a trip on the lower stretch of the river all boats starting out were asked to bring two
questionnaires along on the trip. One was drawn up as a diary with a number of questions to be answered after each day’s sailing. The other was a so-called “end”-questionnaire, which should be filled in when the trip was finalised. This data collection took place during one week in the high season and one week out of the high season. The questionnaires were packed in a sealable waterproof plastic bag together with a prepaid envelope and a ballpoint pen.

*Was the sampling done year round or if not, which season(s)?*

Summer 1999.

*Number of people contacted and response rate*

175 persons agreed to answer the onsite questionnaire and receive the enlarged questionnaire at home. 150 questionnaires were returned after the trip.

168 carried the diary and end questionnaire along on their trip. 120 persons returned the two questionnaires by mail after the trip.

*Ways in which the data was collected*

See “A short description of sampling methodology”

*List of variables studied*

- General questions regarding e.g. group size and composition, as well as a number of questions in relation to especially:
- The number of other visitors seen (on the river, as well as at starting, finishing and camping sites)
- Expectations regarding the trip and seeing other visitors
- Crowding
- Experience of the trip (in general, the nature, the management and other visitors)
- Satisfaction
- Reasons for taking the trip on the river

*Listing which variables were collected for monitoring and which ones for research or other purposes*

—

*How has the information been used or is being used?*

See “Why the study was implemented, for whom are the results collected?”. Not aware of specific use of the results in the planning/management of the river – so far.
Evaluation of the successfulness of the study: strengths and weaknesses?
Strengths: Based on a relatively manageable fieldwork effort, detailed information regarding especially crowding, experience and satisfaction are obtained. Weaknesses: The results have not been spread widely enough among relevant partners.

Level of the monitoring programme on a scale by Hornback and Eagles 1999?

Recommendations for the next time, if somebody was to implement this study in a similar kind of setting

Reference
So far only parts of the data has been utilised in Jensen (2001) – in Danish only.
(Similar data collection to that described above has been accomplished in the same time period with the same methodology on the upper stretch of the river – at the starting point at Tørring, and the portage in Ry).

1.4 Visitor counting, Case 1: Permanent automatic counting – car-borne forest visitors

Frank Søndergaard Jensen
Danish Centre for Forest, Landscape and Planning, KVL

In four forest areas in Denmark, automatic car-counting stations have been in use since 1976.

A short description of the characteristics of the area

- Station 1 (Store Dyrehave, Hillerød): A mixed broadleaf/coniferous forest area situated relatively close to a number of areas with high population density.
- Station 2 (Moesgård Skov, Århus): A broadleaf forest area situated close to an area with high population density.
- Station 3 (Moesgård Strand, Århus): A beach/forest area with a fine bathing beach situated close to an area with high population density.
- Station 4 (Åtte Bjerge, Foldingbro): Hilly coniferous forest area with heath land relatively far from areas with larger population density. A distinct recreational excursion area.
Was the counting done in just one area or several areas?
See above.

Was the counting done year round or if not, which season(s)?
Year round counting.

For how long has it been used?
The four stations have been in use since 1976, and are still running. The data after 1981/82 has only been analysed sporadically.

Have there been any problems with vandalism?
There have not been any problems with vandalism due to the fact that the stations are not visible. The only visible part is a conventional steel cabinet (of the type used by telephone and electricity companies).

Why the counting was implemented, for whom are the results collected?
The establishment of the four permanent counting stations has a two-fold aim:
1. To describe the time-dependent variation and the trends in the extent of the recreational use of selected locations.
2. To form the basis for other specific area surveys (see e.g. “Visitor counting – Denmark (2) National counting survey”).

Who implemented the study?
Researchers implemented the study. Some practical co-operation with the local managers was established at the four specific sites.

Staff requirements (skills, number of employees, working time) e.g. per year
Difficult to estimate as the practical work of inspection and collecting the data is carried out by the Danish Road Directorate.

Costs of the counting, e.g. per year
The annual cost of running the four stations is approximately 12,000 Euros (delivery of raw-data to the Danish Centre for Forest, Landscape and Planning by the Danish Road Directorate – but exclusive data processing/analysis).

Description of the counters
The areas selected for the stations have only one road for car access. At a place where the road is (or made) so narrow that only one car can pass by at a time, two inductive-loop detectors are buried. The inductive-loop detectors are laid in fine sand and covered by 5–10 cm asphalt. One loop is formed as a figure 8 to avoid disturbance between the two loops.

By using “directional-equipment”, the impulse “detector1 – detector 2” is registered as one incoming car, while the impulse “detector 2 – detector 1” is registered as one leaving car.

The original Dutch cassette tape-based equipment (Trafficcorder BCD-MT) was renewed in 1985 with equipment developed by the Danish Road Directorate (T80). The registration interval is set to 15 minutes. Data is collected from the logger approximately once a month. At the same time the battery supply for the logger was renewed, in addition to a general check of the station’s functionality being carried out. A conventional steel cabinet is used for the logger, battery supply, etc.
In summary: All incoming and outgoing vehicles (cars) are detected by inductive-loop detectors and recorded separately in the datalogger every 15 minutes.

An example of the recorded data:

DATL,201111998,1130,,,,,,,
DATL,201111998,1145,,,1,,,,,,
DATL,201111998,1200,,,,1,,,,
DATL,201111998,1215,,,,,,,
DATL,201111998,1230,,,,,,,
DATL,201111998,1245,,,2,,,,,;
DATL,201111998,1300,,,,1,,,
DATL,201111998,1315,,,,1,,,
DATL,201111998,1330,,,,,,

Based on the collected data, the following variables can be determined:

- Number of cars present at an arbitrary time (difference between the summed up number of entering and leaving cars)
- Number of car visitor hours (with round-error depending on registration interval)
- Number of car visits (directly from the separate in- and outgoing traffic)
- Mean length of stay per car visit (estimated from two last-mentioned variables).
How were the counters located and why were these locations chosen?

Based on feedback from a request to all major Danish forest districts regarding relevant and practical locations, the four stations were selected so they could be expected to cover as wide a time dependent variation as possible.

Amount of working time required

The basic establishment of the counting station is relatively time consuming (no exact figures available). When the stations are established and calibrated, the required working time in the field is restricted to collecting data (including a quick check of the functionality of the station) and changing the power supply (battery). This is generally done every month.
Price of the methodology
The price in 1985 was around 1,600 Euros apiece for the T80 equipment. Added to that comes the relatively costly establishment of the inductive loop in the ground, as well as the cabinet and power supply.

Evaluation of the technical functioning of the equipment
Especially after renewing of the counting equipment (T80), the technical functionality has in general been acceptable. Some breakdown periods due to failure in parts of the electronic components are probably inevitable. In addition it is worth mentioning that one station in particular has been struck by lightning a number of times, causing damage to the detector.

Evaluation of the reliability of the results
The mean counting error in counting the number of car visits varies for the four counting stations from -0.3% to 0.5% (based on approximately 5 years of registrations, 1976–1981).

The number of missing registrations is generally low after the renewal of the equipment in 1985 (for several years all 365 days are complete with no missing observations).

How has the information been used or is being used?
The information on the (car-borne) visitor distributions according to time of day, the day of the week, week number and month (as well as sizes and times of peak and off-peak use) has been valuable input in relation to the general management and administration of forest and nature areas in general (e.g. in relation to the issuing of permits for larger events, to reduce visitor conflicts).

Evaluation of the successfulness of the study: strengths and weaknesses
Strengths: The four stations give reliable and long-term (trend) information on the time dependent variations in the car-borne use of four selected forest recreation sites in Denmark.

Weaknesses: Only the car-borne use is studied.

Level of the monitoring programme on a scale by Hornback and Eagles 1999

Recommendations for the next time, if somebody was to implement this counting in a similar kind of setting
Co-operation with other professional organisations/partners with long-term experience in e.g. traffic counting is invaluable.
Reference
See Koch (1984) for detailed results of time dependent variations and trends in the car-borne recreational use of the four selected forest areas (only results from 1976–1981). Also, a detailed description of the methodology and discussion of counting errors is given. The main text is in Danish, but the summary, tables and figures are in English.
More recent utilisation of the data can be found in Jensen (1992) – in Danish only.

1.5. Visitor counting, Case 2: National counting survey

Frank Søndergaard Jensen
Danish Centre for Forest, Landscape and Planning, KVL

Two “national” visitor counts have been accomplished in 1976/77 and 1996/97.
The visitor survey, described under the heading “Visitor surveys Case 2: the National visitor survey”, was done at the same time as the visitor counting described here.

A short description of the characteristics of the area
In 1976/77 446 forests (with a total of 187,000 ha) and in 1996/97 592 forests/nature areas (with a total of 201,000 ha – 174,000 ha forest) were monitored.

Was the counting done in just one area or several areas?
See above.

Was the counting done year round or if not, which season(s)?
Year round counting, 1976–77 and 1996/97

For how long has it been used?
-

Have there been any problems with vandalism?
-

Why the counting was implemented, for whom are the results collected?
The counting was implemented to describe the geographical variation in the intensity of the recreational use of as many different for-
Monitoring outdoor recreation in the Nordic and Baltic countries

est areas as possible. The information is collected for the planners and managers for their local work.

The 1996/97 study was initiated to update the 20-year-old material, looking at trends for the repeated monitored areas and the inclusion of nature areas other than forests.

Who implemented the study?
Researchers implemented the study. Local management staff accomplished the fieldwork for collecting data.

Staff requirements (skills, number of employees, working time) e.g. per year
Thorough written instructions were given before the counting was initiated. The fieldwork was organised in such a way that all the places where forest visitors could park their car (at a given forest/nature area) could be inventoried during 1 hour (counting the number of parked cars). The staff used varied from forest supervisors to forest workers.

Costs of the counting, e.g. per year
In addition to the field costs (which were covered by the specific local area), the preparation, organisation, management, analysis, etc. which was done by the Danish Centre for Forest, Landscape and Planning, KVL amounted to around 450,000 Euros. On average about 75 hours work by the local managers was required for each area. (This includes the visitor survey as well as the simultaneous visitor counting).

Description of the counters
In this case we are not dealing with automatic counters, but using manual counting at specific registration periods which have been selected by stratified random sampling. The counting was carried out at 20 stratified randomly selected moments of max. 1 hour and at 2 subjectively selected times at peak use. The stratification took the seasonally, weekly and daily variation into account (e.g. there are more registrations accomplished during summertime compared with wintertime, and more registrations in the middle of the day compared with mornings and evenings).

At each specified site, all cars were counted (divided into domestic and foreign cars). – See the attached recording data form.

Two ways of enumeration to annual figures based on the sampling are completed:

- Relationship between the samplings and four permanent automatic counting stations – multiple linear regression (see
e.g. “Visitor counting – Denmark (1) Permanent automatic
counting – car-borne forest visitors”).

- Sample estimation (weighting).

How were the counters located and why were these locations
chosen?
As registration places, all places where cars can be parked in rela-
tion to forest visits were covered (parking lots, roadsides, etc.) – the
local manager selected the registration places.

Amount of working time required
(See e.g. “Costs of the counting, e.g. per year”).

Price of the methodology
(See e.g. “Costs of the counting, e.g. per year”).

Evaluation of the technical functioning of the equipment
-

Evaluation of the reliability of the results
-

How has the information been used or is being used?
The collected information is used as the basic knowledge for taking
recreational considerations in the planning and management of the
specific area into account. A concrete example is that one of the
reasons for establishing a new visitor centre at “Møns Klint” was
the high visitation. For the forests (a total of 301 areas) which par-
ticipated in both surveys the information has been used in establish-
ing trends in the development of visitation over the 20-year period.
Finally, the results have formed parts of the basis for budget al-
location from the central office of the Danish Forest and Nature
Agency to the state forest districts.

Evaluation of the successfullness of the study: strengths and
weaknesses
Strengths: Based on a relatively manageable fieldwork effort, in-
formation regarding the number of users is obtained simultaneously
for a large number of forest/nature areas.

   Weaknesses: Only the recreational use of the car borne visitors is
included in the actual counting. Based on information from other
surveys it is possible to estimate the total number of all types of
visitors (based on general knowledge of the relationship between
travelling distance and use of car as means of transportation).
The input for managing and analysing the many areas and data is relatively costly and time consuming.

Level of the monitoring programme on a scale by Hornback and Eagles 1999

Recommendations for the next time, if somebody was to implement this counting in a similar kind of setting

Reference
See Koch (1980) for counting results from the 1976/77 survey. The main text is in Danish, but summary, tables and figures are in English. Results from the 1996/97 survey can be found in Jensen (2003) – in Danish only.
**I.3 Tælledata-skema (størrelse: 1:2.56):**

**Recording Data form (size: 1:2.56):**

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<th>ANTAL BILER ALT.</th>
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</table>

Number on the right side of the form:

| N. N. | 0.536 |

**Translation:**

Project “Forest and Folk”
The Danish Forest Experiment Station
Springfaribane 4, 2930 Klampenborg
Tel. (01) 63 01 62 — ext. 25

**F a F VISITOR SURVEY**

**RECORDING DATA**

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<table>
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</tr>
</tbody>
</table>

No. of the last questionnaire given out:

Recording finished at: hrs. mins.

Any comments:

(Observer)
1.6 Visitor counting, Case 3: Counting in urban areas

Frank Søndergaard Jensen
Danish Centre for Forest, Landscape and Planning, KVL

In three urban parks/nature areas automatic counters have been established in late 2003.

A short description of the characteristics of the area
1. Enghaveparken: 3.6 ha. Urban quarter park in central Copenhagen with garden character.
2. Fælledparken: 58 ha. Activity park in central Copenhagen with park character (e.g. large grass areas for football and other activities).

Was the counting done in just one area or several areas?
See above.

Was the counting done year round or if not, which season(s)?
Year round counting.

For how long has it been used?

Have there been any problems with vandalism?
Not really serious vandalism, but problems in relation to blocking of the sensors in relation to other events at some of the counting places has occurred (e.g. temporary circus and amusement parks) as well as destruction of cables of other administrations like telephone/electricity). Some preliminary problems with the adjustment of the sensors.

Why the counting was implemented, for whom are the results collected?
The Park Department of the Copenhagen Municipality wishes to be able to demonstrate the importance of green areas in the city – in competition with other exploitations. In addition, following the trend in the use of the urban parks is desired.

Who implemented the study?
Researchers implemented the study based on a request from The Park Department of the Copenhagen Municipality.
Staff requirements (skills, number of employees, working time) e.g. per year

Difficult to tell. The counters are inspected once a month (retrieving of data and checking the power supply as well as a general inspection of functionality).

Costs of the counting, e.g. per year

In addition to the field costs (above) the electronics for each station cost about 1000 Euros (in addition comes the cost for oak posts, moulding and mounting of the electronics, etc.

Description of the counters

A Danish electronic company “Info-Scan Instruments” which built the stations for the specific sites supplies the counters. It is an active infrared counter with separate transmitter and receiver. The visible part of the transmitter and receiver is very small – the size of a 50-cent coin. These devices are incorporated into the official signing posts used in public areas – green painted oak posts. The logger, power supply, etc., is placed in a conventional steel cabinet – of a type used by telephone and electricity companies. (See photographs). The data are recorded at one-hour intervals.
How were the counters located and why were these locations chosen?
As registration places, the major entrance in each of the three parks was chosen (in Fælledparken three entrances are covered).

Amount of working time required
–

Price of the methodology
(See e.g. “Costs of the counting, e.g. per year”).

Evaluation of the technical functioning of the equipment
(See e.g. “Have there been any problems with vandalism?”).
–

Evaluation of the reliability of the results
–

How has the information been used or is being used?
The first report is underway.

Evaluation of the successfulness of the study: strengths and weaknesses
–

Level of the monitoring programme on a scale by Hornback and Eagles 1999
–

Recommendations for the next time, if somebody was to implement this counting in a similar kind of setting
–

Reference
Jensen & Guldager (2005).
Appendix 2: Estonia

2.1 Visitor surveys: Case of a visitor survey in RMK Kiidjärve-Taevaskoja Recreation Area 2003

Anu Almik
The Estonian State Forest Management Centre, RMK

A short description of the characteristics of the area, e.g. locals vs. tourists, day-use vs. overnight use etc.

Why was the study implemented, for whom are the results collected?
The manager of Estonian state forests, RMK, creates diverse opportunities for outdoor activities in 10 recreational areas. To find out the development needs and making optimum financing decisions, RMK has conducted visitor surveys in recreation areas. In 2003 the visitor survey was carried out on 9 recreational areas of RMK to establish the motivation, preferences and needs of visitors in recreational areas and to determine whether the developed facilities meet the expectations of the users. The arrangement of the visitor survey in RMK recreation areas relies on the visitor survey manual of Metsähallitus.

RMK Kiidjärve-Taevaskoja recreation area is a compact area, which has had a long history of recreational use. In this area sandstone outcrops are located, which are noteworthy in Estonia. Within the boundaries of the recreation area there are several protected areas, which cover 35 per cent of the recreation area. In the zone of the recreation area the nature tourism business is well developed.

According to the results of the 2003 visitor survey, 38.5 per cent of the visitors came from the two largest Estonian cities, Tartu and Tallinn. Most typically, two visitors came to the recreation area by car. Usually the party consisted of family and friends or relatives. The main activities they participated or wished to participate in were exploring nature, walking and being in the forest. The most important visitation site was the sandstone outcrop Taevaskoda. One-day visitors accounted for 43 per cent and overnight visitors for 57 per cent of the total. The recreation area was not the main travel destination of visitors.
Who implemented the study (managers, researchers, volunteers, etc.)?

To collect the data for the 2003 visitor survey in the RMK Kiidjärve-Taevaskoja recreation area, two employees were hired, and these used a total of 59 collecting days (à 4 h). One person was engaged in entering the data and writing the reports; 18 working days were spent on these two tasks. It is difficult to distinguish the working time spent on planning, because it was done in parallel with other tasks. It could take an estimated 5 days.

Staff requirements

The interviewer must have good communication skills and be very knowledgeable about RMK and the recreation area; the person should be involved in the whole process of organising the visitor survey. The person who enters data must be precise and thorough.

Costs

The total costs were approximately 23,000 Estonian kroons.

A short description of sampling methodology

The target group of the 2003 visitor survey in Kiidjärve-Taevaskoja recreation area included persons of at least 15 years of age, who visited the area in the period from June to September. The principles of sampling and the plan for collecting data were prepared beforehand and in these the trends concerning the number of questionnaires and the target group and the division of questionnaires by data collection points were devised. The schedule for collecting data (day of the week and time of day) was determined by casting lots after the data collection points for each week had been decided.

The random sample method was used for sampling. From a group of two to four people the person whose birthday was the closest to the data collection day was interviewed. From a group of five to ten members, two people whose birthday was the closest to the data collection day were chosen. From a large coach four people were interviewed – two men and two women, whose birthday was nearest to that date. In a camping area and a publicly used picnic site, one person from each tenth party was asked to fill in the questionnaire. The planned number of respondents or the sample was 300 people. For collecting data, questionnaires were used, which the visitors filled in themselves as a rule, and in a few cases the interviewer filled it in for them. The questionnaires were in Estonian and each interviewer could also use a Russian translation of the questionnaire.
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Was the sampling done year round or if not, which season(s)?

Number of people contacted and response rate
In total 323 filled-in questionnaires were received from the RMK Kiidjärve-Taevaskoja recreation area during the period 15.06.–15.09.2003. 38 people refused to respond.

List of variables studied (and questions asked, if they are available in English)

Listing which variables were collected for monitoring and which ones for research or other purposes
Gender, age, education, place of residence, size and type of group, importance of the recreation area as a destination, activities, division of the number of visiting times over the recreation area, duration and repeatability of visitation, month, day of the week, time of arrival and transportation means used to arrive in the recreation area, costs related to the visit (meals, accommodation, transport costs), source of information, purpose of the visit, evaluation of the facilities and surroundings of the recreation area, expectations, disturbing factors. All the collected data are necessary for specifying the development needs and organising activities in the recreation area.

How has the information been used or is being used?
The results of the visitor survey were analysed after the report was completed. The results of the 2003 visitor survey enabled the researchers to pinpoint the more frequently visited places, and the data were used in the visitor volume survey to specify counter locations.

Measures have been taken to expand the recreation area in order to reduce the visitation at three highly used sites, so that the large proportion of protected areas would not restrict the outdoor activities, to offer sites for amateur researchers and nature excursionists further from the mass visitation areas, to enable the creation of additional camping sites.

To consider the people with special needs a path is being planned to the most visited site in the recreation area, Suur-Taevaskoda. To raise the level of commercial services in the recreation area, co-operation with businessmen will be improved. Monitoring of the recreation area sites will be implemented to improve the condition of toilets and the general cleanliness and to manage and decrease littering of the environment. This will involve correction measures and will be supported by the ranger project.
Evaluation of the successfulness of the study: strengths and weaknesses?

The visitor survey in the RMK Kiidjärve-Taevaskoja recreation area was successful. One of the strengths was surely the team spirit, the teamwork. The preparation for the survey was thorough.

Level of the monitoring programme on a scale by Hornback and Eagles 1999?

The visitor monitoring level in the recreation area according to the analysis method described in the “Guidelines for Public Use Measurement and Reporting at Parks and Protected Areas”, is IV Developed.

Recommendations for the next time, if somebody was to implement this study in a similar kind of setting

If a visitor survey is conducted in the future in similar conditions, it is very important to pay attention to the preparation of the sampling plan, the precise wording of the questionnaire, and the provision of training for the interviewers.

Reference

Rammo et al. 2004
Appendix 3: Finland

3.1 Visitor survey, Case 1: Standardised surveys in state-owned protected and recreational areas managed by Metsähallitus

Joel Erkkonen
Metsähallitus, National Heritage Services

A short description of the characteristics of the area, e.g. locals vs. tourists, day-use vs. overnight use etc.
The surveys have been implemented in those state-owned protected and recreational areas managed by the Natural Heritage Services of Metsähallitus (Forest and Park Service) where recreation plays a significant role in the use of the area.

Why was the study implemented, for whom are the results collected?
The standardised methodology described here is a result of a visitor survey standardisation project conducted in cooperation with METLA (Finnish Forest Research Institute), Metsähallitus and the University of Helsinki in 1998–2000.

The results are of interest both for Metsähallitus and for managerial and reporting purposes. In addition, they are of interest to researchers for in-depth studies.

Who implemented the study (managers, researchers, volunteers, etc.)?
The field work is implemented under the supervision of Metsähallitus managers. For individual studies, temporary employees such as university students are often hired.

Staff requirements (skills, number of employees, working time)
Usually one visitor study implemented by this standardised methodology requires about half a year’s work. It varies depending on the area-specific circumstances.

Costs
See above: staff requirements. Copying of survey questionnaires and data processing machinery are additional costs. A more detailed estimate is available in The Visitor Survey Manual by Erkkonen & Sievänen 2001, Chapter 3.2.4: Determining what resources are necessary.
A short description of sampling methodology

From the standpoint of sampling, it is important that the visitors in the sample are chosen independently of the data collector and other visitors. This independence is ensured by using random selection in at least one phase of the sampling. The question of how well the sample represents all the visitors always involves some uncertainty, which we try to control by means of a large sample and careful sample planning. The actual sample plan varies from area to another.

Was the sampling done year round or if not, which season(s)?

Sampling is done during the seasons when there are significant numbers of visits to the area.

Number of people contacted and response rate

Due to the interviewing methodology, the response rate is high, 80–90%. Thus, the number of responses is very close to the number of people contacted. Usually a sufficient number of responses is considered to be around 400 per season. But there has been some variation in the sampling methodology, which has also caused differences in the number of responses. Altogether between 1998–2004 about 50 surveys have been implemented yielding some 20,000 responses.

Ways in which the data was collected: mail, on-site guided interviews, on-site but self-guided etc.

The data is always collected via on-site guided interviews. However, an option of a postage-paid mail reply has been provided in some cases if the respondents are in a hurry. This is the case e.g. if there is a public transport connection to the area.

List of variables studied (and questions asked, if they are available in English)

- visitor profiles
  - socio-economics: age, gender, education and place of residency
  - size and type of group: number of group members under 15 years of age, number of disabled persons
  - experience of the area: whether they have visited the area before, when was the first visit to the area
- activities in the area
  - 20 standardised activity choices, 10 area specific choices (check all that apply)
- length of stay in the area
- visitor satisfaction
  - An indicator consisting of almost 20 different factors
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- evaluation of the quality and quantity of services and the quality of the environment
- are the expectations being met
- disturbances
  - motivation
    - motives
  - duration of visits
    - day vs. overnight, visitor days
  - mode of stay
    - wilderness hut, hotel, etc.
  - distribution of use in time
    - season, weekday, hours
  - expenditure during visits
    - meals, accommodation, travel costs, other?
  - Area specific questions such as traffic arrangements, need for certain type of services, etc.

An older version of a questionnaire is available in English in the translated manual (Erkkonen & Sievänen 2001); a new version of the questionnaire should be available in English in the spring of 2006.

Listing which variables were collected for monitoring and which ones for research or other purposes

All the variables are being used in monitoring. In addition, they have been used for various other purposes:

How has the information been used or is being used?

The information has been used in:

- land use management planning
- visitor management
- monitoring changes
- planning of operations at Metsähallitus Visitor Centres and Customer Service Points
- allocation of resources
- estimating impacts on regional economy
- monitoring impacts and estimating sustainability of nature tourism
- marketing and communications
- e.g. environmental interpretation material
- comparisons between areas or locations
- research cooperation
- statistics
- estimating recreation demand
- developing nature tourism entrepreneurships
Evaluation of the successfulness of the study: strengths and weaknesses?

This methodology is for the most part sufficient and useful for Metsähallitus purposes. For research purposes, it is good in giving an overview of the state-owned protected and recreational area visitors. With the help of a new development project underway, the reliability, usefulness and especially availability of the data for both management and research purposes should be further enhanced. Comparisons of data between areas are possible when using standardized questionnaires. A weakness is the limited possibilities to apply area-specific questions when the area has very distinctive characteristics, at least concerning some items in the questionnaire. This problem concerns particularly the questions measuring money use, e.g. in areas visited typically during a multi-destination trip (e.g. in archipelago).

Level of the monitoring programme on a scale by Hornback and Eagles 1999?
Level III: Intermediate, especially in terms of staff and resources.

Recommendations for the next time, if somebody was to implement this study in a similar kind of setting

In order to further develop good practices relating to visitor information processes, there is an ongoing development project in Metsähallitus. In this project the aim is to improve reliability, accessibility and applicability of visitor information by

- combining the currently somewhat separate processes of visitor monitoring into one entity,
- developing a uniform data-base application,
- updating the Metsähallitus guidelines and manuals for visitor monitoring and
- training the personnel to use the updated methods and the new application.

Reference
Erkkonen & Sievänen 2001, Erkkonen et al. 2005
3.2 Visitor survey, Case 2: Aulanko and Ahvenisto
Urban Recreation Areas in City of Hämeenlinna

*Tuija Sievänen*
Finnish Forest Research Institute

A short description of the characteristics of the area, e.g. locals vs. tourists, day-use vs. overnight use etc.
The survey was made in two urban recreation areas in the small city of Hämeenlinna. These two areas were in heavy use by local residents, and in the Aulanko district there are plenty of tourists visiting the area. The number of visits in Aulanko and Ahvenisto was estimated to be about a half a million annually each at the time of the study. These two areas are fairly small in size, Aulanko being about 250 ha and located 3 km from the city centre, but the closest housing area is next to the forest. Ahvenisto covers about 200 ha and is located about 2 km from the city centre, but it is surrounded on its boundaries for the most part by housing areas. There are about 47,000 inhabitants in Hämeenlinna. All use is day use, and all visitors to Ahvenisto are locals, but about one third of visitors to Aulanko are tourists. Part of Aulanko is a famous historical park with a view of the nearby landscape recognized as one of 'the national sceneries'.

Why was the study implemented, for whom are the results collected?
The departments of forestry and sports in the City of Hämeenlinna needed visitor information to develop services and facilities in the recreation areas. The demand for information was partly due to criticism from the public and media concerning the management of urban forests. The municipality agencies in Hämeenlinna were the main users of the information. The objective of the study was to obtain information on visitors to urban forests, their recreation behaviour, and opinions about the services and facilities provided in recreation areas.

Who implemented the study (managers, researchers, volunteers, etc.)?
The Finnish Forest Research Institute conducted the study independently. A student was hired to collect the data onsite. The researcher analysed and wrote the report (Sievänen 1993).
Staff requirements (skills, number of employees, working time)
A university student with good instructions was able to collect the data, and a researcher with some basic statistical skills was able to analyze and report the results.

Costs
Data collection demanded about 30–40 working days over 5 months. Data managing demanded about 15–20 days, and report writing 20 days, approximately (precise information is not available).

A short description of sampling methodology
Sampling was done during May–September. Data collection took place in 20 different interviewing sites in these two areas. The time for interviews was from 7 a.m. to 8 p.m. In Aulanko, where a significant number of visitors are tourists, a separate questionnaire was handed to tourists.

Was the sampling done year round or if not, which season(s)?
Sampling was done during the summer season, which is the busiest season, but it was beneficial to carry out year-round data collection.

Number of people contacted and response rate
Due to the interviewing methodology, the response rate was high (95 %), and only 5 % of visitors refused. The numbers of responses were 311 in Aulanko and 234 in Ahvenisto.

Ways in which the data was collected: mail, on-site guided interviews, on-site but self-guided etc.
The data was collected by on-site interviews, e.g. a structured questionnaire was filled by the interviewer, and two separate cards were handed to the respondent when a multi-scale question demanded more careful concentration and help in understanding. The survey had 18 questions and the duration of the interview was about 10–12 minutes.

List of variables studied (and questions asked, if they are available in English)
- visitor profiles
  - socioeconomics: age, gender, education, socioeconomic status, and place of residency
  - type of transportation to areas; walking, cycling, by car, by bus, by horse
  - size and type of group: number of group members under 15 years of age, experience of the area: whether they have
visited the area before, and when was the last time, if they visit other urban forests in Hämeenlinna

- activities in the area
  - 13 standardised activity choices, space for more activities
- length of stay in the area, arrival time and time for leaving
- other destination during the same outing
- visitor satisfaction
  - An indicator consisting of almost 17 different factors
  - evaluation of the quality and quantity of services
  - opinion of trails and roads for walking
  - disturbances/shortages (open ended questions)
  - wishes for future development (open ended questions)
- motivation scale of 14 items
- opinion of the importance of forest in urban environment.

Listing which variables were collected for monitoring and which ones for research or other purposes

All the variables were used for the practical information need in the planning process.

How has the information been used or is being used?

The information was used for the planning and development of services and facilities in the areas by municipality agencies.

Evaluation of the successfulness of the study: strengths and weaknesses?

The process of developing a visitor survey methodology was a good experience for researchers, and helped in the continuation of developing methods in other surveys. The weakness of this arrangement was that when the study was done by a researcher coming from outside the municipality agency, the study did not receive any follow-up study, and the objective of monitoring was not met.

Level of the monitoring programme on a scale by Hornback and Eagles 1999?

I??

Recommendations for the next time, if somebody was to implement this study in a similar kind of setting

An interview of 7–10 minutes represents maximum time use for such an interview in an urban area.

Reference

Sievänen 1993
3.3 Visitor counting, Case of Arctic Circle Hiking Area

Joel Erkkonen
Metsähallitus, National Heritage Services

A short description of the characteristics of the area, e.g. locals vs. tourists, day-use vs. overnight use, heavy use area vs. low use area etc.

The Arctic Circle Hiking Area is a rather new recreational area only 20 km north of the city of Rovaniemi. The size of the area is about 3000 hectares. Visitor flows are very focused with a well accomplished infrastructure (bridges, duckboards, nature trails, fire places and lean to’s etc.). There are two main entrances to the area. Fairly heavy day use by the local people is a characteristic of the area.

Was the counting done in just one area or several areas?
A similar kind of counting has been done in several Metsähallitus areas. But the case of the Arctic Circle Hiking Area is exceptionally simple compared to other areas because of the focused use and the existence of only a few entrance points.

Was the counting done year round or if not, which season(s)?
The counting has been done year-round since 2002

For how long has it been used?
The counting has been done year-round since 2002

Have there been any problems with vandalism?
There has actually been no vandalism at all with the counters in Lapland. In southern Finland vandalism is a slightly more complex issue.

Why the counting was implemented, for whom are the results collected?
The Arctic Circle Hiking Area is one of the target areas where the resources and services are focused in Lapland by Metsähallitus Natural Heritage Services, Northern Finland. In all kinds of areas with high priority, visitor counting should be done as a management routine.
Who implemented the study (managers, researchers, volunteers, etc.)

Visitor counting was implemented by the staff of Metsähallitus (senior planning officers and rangers).

Staff requirements (skills, number of employees, working time) e.g. per year

The counters require regular maintenance. The readings of the counters should be observed twice a month and the batteries must be charged and changed once a month. Counters are installed in the constructions of two bridges and they are easy to reach. The location of the counters is optimum in the sense of maintenance.

Costs of the counting, e.g. per year

The only costs are the hours used by the rangers with reading the counters and charging and changing the batteries. The batteries can survive for years even in a very demanding climate, if they are covered against frost and ice well enough.

Description of the counters

The counters usually comprise infrared photocell sensors, a power source and a counter with delay circuits and a housing. The power source is generally an enclosed lead or nickel battery, which is selected to suit the counter and its application.
How were the counters located and why were these locations chosen?

The counters are located at two main entrance points: Vikaköngäs and Vaattunkiköngäs. It is estimated that 90% of the visits to the area go through these two points.

Amount of working time required

The readings of the counters should be observed twice a month and the batteries must be charged and changed once a month. The results are entered into an Excel sheet approximately once a month.
Price of the methodology
About 500 Euros including the extra batteries.

Evaluation of the technical functioning of the equipment
The counters require regular maintenance (at least twice a month). Ice and frost might be harmful especially for the batteries in the long run. Technical functioning and reliability of the counter is better when visitors are walking in line instead of walking side by side. Therefore, a narrow trail or a bridge is optimal place for installation.

Evaluation of the reliability of the results
The case of visitor counting in the Arctic Circle Hiking Area is rather simple because of the two main entrance points.

How has the information been used or is being used?
The annual number of visits made to the Arctic Circle Hiking Area is very important in many ways. For instance, it is important for resource allocation by Metsähallitus. In 2004 the number of visits to the Arctic Circle Hiking Area was 35,500.

Evaluation of the successfulness of the study: strengths and weaknesses?
This has been one of the most successful cases of visitor counting in Metsähallitus. It has been a good example of developing the methods of visitor counting. The results are rather reliable.

The methods of counter calibration and defining the total number of annual visits are being developed with the help of experiences from the Arctic Circle Hiking Area.

One of the biggest weaknesses is the consumption of electricity. The batteries require regular maintenance (charging) and that might be felt to be an extra workload for the rangers.

Level of the monitoring programme on a scale by Hornback and Eagles 1999?
III??

Recommendations for the next time, if somebody was to implement this counting in a similar kind of setting.
Try to find counters that can survive years without changing batteries e.g. pressure mats.
Appendix 4: Norway

Visitor counting, Case of visitor counting in six areas (partly conservation areas) in the county of Nordland

Odd Inge Vistad
NINA, Norwegian Institute for Nature Research

During the spring of 2004 collaboration between Statskog Fjelltjenesten and Nordland Fylkeskommune (Nordland County Municipality) resulted in the start of a visitor counting project in six different recreational and protected areas in Nordland. This is the county in Norway with most national parks. In addition, the two collaborating offices in this county have for a long time prioritised the recreational field.

This is probably the most comprehensive counting project in Norway implemented by a management authority.

Background
The project is based on the need to know more about the recreational use of some popular or otherwise important nature areas. Several questions could be dealt with: Do efforts at stimulating outdoor recreation work? Are there any effects on visit numbers from new physical facilities in the area, public arrangements for recreation, or campaigns or writings in the newspapers? Etc.,…

The equipment
The registration equipment comprises trampling mats from Schmidt Electronics in Inverness, Scotland. Mats (70x60 cm) are placed 6–7 cm down in the trails, before earth and gravel is replaced on top. The mats are connected to a hidden data collector through a hidden (in the ground) cable. The data can be transferred from the data collector to a computer with a special cable and software. A step on the mat gives a count. The price for one set of counting equipment is around NOK 10,000.

Sources of error?
The experience is that the counters work quite precisely. But there are some sources of error: If visitors are running or take long steps, they may not hit the mat. Miscounting might also occur if two persons are walking shoulder to shoulder. The main judgement is that
there should be little risk in comparing the data over time, within the same area.

Now the second season with registration has been completed, but not yet reported. Carl Norberg in *Fjelltjenesten* (personal comment) says that the equipment mostly worked well during the last season as well, but with one exception because a data collector stopped functioning.

The same type of equipment (may be older versions?) have also been tried in other areas (Rogaland, Bergen, Grimsdalen/Rondane – see the main text “Visitor monitoring in Norway”) and with quite a lot of technical problems.

*What will the counting tell?*

Both the number of steps and time for “every step” is registered (when everything works). The counting will give information on the daily, weekly and seasonal variation. These variations can be judged in relation to managerial actions or other events. In one of the study areas a national park centre was established during 2005; counting in 2006 might say something about the short time effects of this establishment. The plan is to take counts for 2 or 3 seasons before the equipment is moved to other areas.

*Study areas*

Six study areas have now been chosen. The Futelva (recreational area, fishing river) in Bodø, an entrance to Rago National Park, the trail entrance to Junkerdalsura nature reserve close to Saltld Tourist center, an entrance to Saltfjellet-Svartisen National Park, Stavassdalen in Grane, and an entrance to Børgefjell National Park. The six areas are relatively easily accessible and located in different parts of the county.

In Futelva the counter was introduced in the autumn of 2003. In the other areas counting started in late June or early July 2004 (due to late delivery from Scotland).

*Reports*

A report from the first registration year is presented:
Statskog Fjelltjenesten & Nordland fylkeskommune 2005. Registreing av ferdsel i friluftsområder I Nordland. (contact: carl.norberg@statskog.no) In this paper the preliminary findings after one season of counting are presented for each of the studied areas.

*Personal contact*

Carl Norberg, Fjelltjenesten, Eiaveien 5, 8200 Fauske, Norway, +47 75 64 77 80
Appendix 5: Sweden

5.1 Visitor survey, Case 1: Fulufjället National Park

Peter Fredman
Mid-Sweden University

Fulufjället National Park is located in the county of Dalarna in the southern part of the Swedish mountain region. The park is 380 km\(^2\) in extent, primarily featuring a low alpine region with large areas just reaching above the tree-line at 700 metres above sea level. Since Fulufjället is not utilized for reindeer grazing, it has large areas of thick lichen covering the ground which is unique for the Swedish mountain region. The area is also known for its wildlife populations, including bear, moose and nesting birds of prey. Fulufjällets National Park features the highest waterfall in Sweden – Njupeskär. This is a major tourist attraction in the region and the access to the 90-metre high fall is by car or bus to the trail head followed by a three kilometre round trip hike. The waterfall, the trails to the fall and the major park entrance with car parking, cafeteria and a visitor centre are located in the most developed zone of the park. Part of the process to establish Fulufjället National Park was the implementation of four management zones; 1) a wilderness zone, 2) a low-intensity activity zone, 3) a high-intensity activity zone, and 4) a development zone. These zones are an important instrument to meet the objectives of the park and to supply a spectrum of different recreation opportunities. There is a small fishing camp at Rösjön in zone 3, and a network of small cabins and marked trails throughout the park that provides good opportunities for backpacking. Visitor surveys were undertaken at Fulufjället National Park in the summers of 2001 and 2003 – one year before and one year after national park designation respectively. Automatic trail counters were used at four different locations – two at Njupeskär waterfall and two in back-country areas. Based on this data, the number of visitors was estimated at 38,000 in 2001 and 53,000 in 2003 – an increase by almost 40%. Figures reported here refers to the 2003 study (Swedish and German visitors) unless otherwise stated.
A short description of the characteristics of the area, e.g. locals vs. tourists, day-use vs. overnight use etc.

About 95% of all visitors to the park will come to zone 4, and 54% will only come to this zone, which is the most developed part of the park including Njupeskär waterfall. A majority (95%) arrive by car, and 67% come primarily to visit Njupeskär waterfall. Only about 4% visit Fulufjället as part of an organized trip. The average visitor is 49 years old 53% are female and 41% have a university degree. About 30% of all visitors an non-Swedish, primarily including Germans (14%), Danes (7%), Dutch (4%) and Norwegians (2%). Most visitors (78%) do a short hike (1–3 hours), 21% a one day hike, and 5% a multiple day hike. Berry- or mushroom picking is done by 4%, nature photography by 31% and birdwatching / nature studies by 17%. The average distance hiked during the visit is 9.9 kilometres. 22% did stay overnight within or close to the park.

Why the study was implemented, for whom are the results collected?
The study was implemented by the European Tourism Research Institute at Mid-Sweden University for the Swedish Environmental Protection Agency.

Who implemented the study (managers, researchers, volunteers, etc.)?
The study was implemented by a group of researchers with some field work assistance from local managers.

Staff requirements (skills, number of employees, working time)
Planning and field work:
- Project leadership / method development: Senior researcher, 3 months
- Field assistant: Undergraduate student, 3 months
- Local staff: manager / assistant, 1 month

Data analysis and report writing:
- Senior researcher 2 months
- Assistant / statistician 2 months

Plus the input from an advisory committee: 4 persons, 3 meetings.

Costs
70,000 Euros for field work and data analysis. Final report not included.
A short description of sampling methodology

Seven self-registration boxes were located at the major entrances of the national park. Sampling locations were selected after discussions with park managers in order to represent different visitor categories and locations. Each box was placed clearly visibly along the hiking trail together with a poster asking the visitors to fill out a registration card containing a few questions concerning the visit and the person’s name and address. The completed cards were placed in a locked section of the box. A sample of the Swedish and German visitors who registered at the self-registration boxes received a mailed questionnaire sent to their home address a few months after their visit to Fulufjället. Two remainders were sent out, including a new questionnaire in the second one. Onsite check-ups were done at the self-registration boxes to identify possible biases from non-respondents along the trail to Njupeskär waterfall.

Was the sampling done year round or if not, which season(s)?
June to September.

Number of people contacted and response rate

<table>
<thead>
<tr>
<th>Completed registration cards</th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Swedish mail survey</td>
<td></td>
<td>6,151</td>
</tr>
<tr>
<td>Completed</td>
<td></td>
<td>804</td>
</tr>
<tr>
<td>Response rate</td>
<td></td>
<td>82%</td>
</tr>
<tr>
<td>German mail survey</td>
<td></td>
<td>441</td>
</tr>
<tr>
<td>Completed</td>
<td></td>
<td>441</td>
</tr>
<tr>
<td>Response rate</td>
<td></td>
<td>85%</td>
</tr>
</tbody>
</table>

Ways in which the data was collected: mail, on-site guided interviews, on-site but self-guided etc.

See above.
List of variables studied (and questions asked, if they are available in English)

Questionnaires are available in Swedish and English. The questionnaire included 60 questions in the following categories;

- Travel characteristics (before / after park visit)*
- Activity participation and motivation*
- Visitor patterns (space, time)*
- Attitudes to park policy and management*
- Visitor experiences*
- Recreational capacity / crowding\textsuperscript{R}
- Tourism development\textsuperscript{R}
- Attitudes toward National Park\textsuperscript{R}
- Economic impacts / visitor expenditures\textsuperscript{R}
- Socioeconomic characteristics*\textsuperscript{R}

About two-thirds of all questions were also asked in 2001, making comparisons over time possible.

Listing which variables were collected for monitoring and which ones for research or other purposes

Categories marked with an * above included questions intended for monitoring, and \textsuperscript{R} had questions primarily for research.

How has the information been used or is being used?

Results from the 2001 study were used as input for the management plan of the park. The 2003 study is being used for short term follow-up on park management and visitor experiences / impacts. The study methodology is being communicated to other park managers.

Evaluation of the successfulness of the study: strengths and weaknesses?

Strengths; Successful combination of different survey methods, i.e. onsite counters, self registration boxes and follow-up mail questionnaires. Will give a fairly “complete” picture of the visitors to the area. Opportunities for method development. Co-operation between researchers (university) and managers. Results used for development of management plan.

Weaknesses: Too complex for most local managers to handle without support from experts in survey methodology. High cost. Sensitive to weather conditions. Self registration boxes need to be looked after continuously. Possibility of non-response bias at self registration boxes.
Level of the monitoring programme on a scale by Hornback and Eagles 1999?

III – IV

Recommendations for the next time, if somebody was to implement this study in a similar kind of setting.

Two most important recommendations are; 1) to have an educated and committed field assistant onsite during the entire data collection period for maintenance of self registration boxes and visitor counters; and 2) to choose locations for data collection with great care – considering exposure to weather, roads, visitor frequencies, etc.

Reference

5.2 Visitor survey, Case 2: Skiers and snowmobilers in Southern Jämtland Mountains

Peter Fredman
Mid-Sweden University

The Southern Jämtland Mountain (SJM) area is located in central Sweden, bordering Norway to the west. The total area is about 2,300 km² and consists mostly of bare mountains and forested mountain valleys. It is the most alpine area in this part of the Swedish mountain region, and higher and steeper mountains can be found only in the northern counties. Sweden’s most southern glacier is found in the area, which is known as one of the most important haunts for threatened mammals. The SJM area is a nature reserve that was proposed as a national park in the late 1990’s, but the designation process was stopped because of local opposition. The whole area is used for reindeer herding, fishing and hunting. Outdoor recreation is extensive, with some of the trails being among the most frequently used in the Swedish mountains. The SJM area has the densest network of publicly-managed trails in the Swedish mountains. The system includes about 500 km of marked summer and winter trails and about 200 km of snowmobile trails. There are three mountain lodges and several cabins managed by the Swedish Touring Club, and several private hotels and cabins located just outside the area. Increasing snowmobile use causing conflicts with cross-country skiing activities is a major concern among managing agencies and several tourism organizations.
A short description of the characteristics of the area, e.g. locals vs. tourists, day-use vs. overnight use etc.

The SJM is popular for winter recreation both among local residents and more distant visitors. It is accessible by air, car and train from the south of Sweden.

Snowmobilers: The average number of days that respondents spend snowmobiling in SJM is estimated at 12 per year. People are primarily visiting for daytrips – only 17 percent made an overnight stay. Average age is 45 years (more than half are between 45 and 65 years), 81% are male and 25% hold a university degree.

Skiers: On average, skiers spend six days in SJM per year. Average age is 45 years, there is an equal split between male and female and 77 % hold a university degree.

Why the study was implemented, for whom are the results collected?
The study was implemented by the European Tourism Research Institute at Mid-Sweden University financed by the Mountain Mistra Research Programme.

Who implemented the study (managers, researchers, volunteers, etc.)?
Researchers and field assistants.

Staff requirements (skills, number of employees, working time)
Planning and field work:
• Project leadership / method development: Senior researcher, 2 months

Field assistant:
• 3 undergraduate students, 0.5 months

Data analysis and report writing:
• Senior researcher 2 months
• Assistant 2 month

Costs
40,000 Euros.

A short description of sampling methodology
The visitor surveys were administered in two steps. The first step involved contacting visitors on-site at trailheads, rest huts and camping (caravan) areas. Every visitor encountered by the interviewers was asked to complete a one-page survey, which included recording of names and addresses to receive the longer mail survey. Each visitor that provided a name and address was then sent the
skier mail or snowmobiler mail survey, as appropriate. Two reminders were sent out, including a new questionnaire in the second one. For the snowmobiler on-site survey (and thus also the snowmobiler mail survey), only drivers were asked to complete the survey – passengers were not surveyed. An incentive (10:an lottery ticket) was used to thank survey participants and to encourage high response. In addition, a notice about the survey was publicised in the local newspaper.

*Was the sampling done year round or if not, which season(s)?*

Skiers: April 1 – 11.
Snowmobilers: April 1 – 17.

*Number of people contacted and response rate*

<table>
<thead>
<tr>
<th></th>
<th>Snowmobiler</th>
<th>Skier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persons contacted on-site</td>
<td>253</td>
<td>565</td>
</tr>
<tr>
<td>Persons refusing on-site survey</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Persons completing onsite, but refusing mail</td>
<td>17</td>
<td>36</td>
</tr>
<tr>
<td>Persons sent mail survey</td>
<td>230</td>
<td>505</td>
</tr>
<tr>
<td>Mail surveys returned as non-deliverable</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Mail surveys returned completed</td>
<td>143</td>
<td>374</td>
</tr>
<tr>
<td>Completed as percent of mail surveys delivered</td>
<td>63%</td>
<td>75%</td>
</tr>
<tr>
<td>Completed as percent of total contacts</td>
<td>57%</td>
<td>66%</td>
</tr>
</tbody>
</table>

*Ways in which the data was collected: mail, on-site guided interviews, on-site but self-guided etc.*

See above.

*List of variables studied (and questions asked, if they are available in English)*

Questionnaires are available in Swedish only. The onsite questionnaire included 6 questions and the mail survey 31 questions (skiers survey) / 33 questions (snowmobile survey) in the following categories;

- Activity participation (in general and SJM)\(^R\)
- Visitor patterns (space, time)\(^R\)
- Visitor experiences\(^R\)
- Interactions with other visitors / recreation conflicts*
- Preferences for different trails (choice modeling scenario)\(^R\)
- Attitudes toward area management\(^R\)
- Socioeconomic characteristics*\(^R\)
Listing which variables were collected for monitoring and which ones for research or other purposes

Categories marked with an * above included questions intended for monitoring, and R had questions primarily for research.

How has the information been used or is being used?

Data on recreation conflict (i.e. disturbance of skiing by snowmobiling) has been used by the county administration board in their work on trail separation in the area. Information on trail preferences has been communicated to local and national snowmobile and ski organizations.

Evaluation of the successfulness of the study: strengths and weaknesses?

Strengths: Successful combination of different survey methods, i.e. onsite interviews and follow-up mail questionnaires. Co-operation between researchers (university), managers and local tourism industry. Focus on specific management problem.

Weaknesses: Rather labour intensive to achieve high number of responses. Especially snowmobilers hard to survey on site as they sometimes move around very fast in very unpredictable patterns. Hard to get representative samples of users with limited field staff. Weather dependent and not cost efficient to collect data outside peak season.

Level of the monitoring programme on a scale by Hornback and Eagles 1999?

III

Recommendations for the next time, if somebody was to implement this study in a similar kind of setting

Try to prestudy use patterns of snowmobilers in order to increase efficiency in data collection.

Reference


5.3 Visitor counting, Chambers Radio Beam 2000

Ingemar Ahlström
Friluftsplanering
A short description of the characteristics of the area, e.g. locals vs. tourists, day use vs. overnight use, heavy use area vs. low use area, etc.

Heavily used recreational area (nature reserve Järvafältet) for day use with urban surroundings. Visitor categories: Walkers, joggers, cyclists, horse-back riders, picnickers, birdwatchers etc.

Was the counting done in just one area or several areas?
One area.

Was the counting done year round or if not, which season(s)?
Spring, summer.

For how long has it been used?
Used in 2000–2005 during different periods year around.

Have there been any problems with vandalism?
No

Why the counting was implemented, for whom are the results collected?
To get an idea of the number of visitors to different parts of the area, and the distribution of visitors over day and week. The results are collected for the manager of the recreational area.

Who implemented the study (managers, researchers, volunteers, etc.)
Firm of consultants Friluftsplanering at the request of manager and National Environmental Authority.

Staff requirements (skills, number of employees, working time) e.g. per year
One person used to the counter. Working time 40 hrs during 2004.

Costs of the counting, e.g. per year
2000 € /year.

Description of the counters
The counter consists of a radio transmitter and receiver. Size of transmitter is 120x80x55 mm. Transmitter for the model with display has depth of 85 mm. Size of receiver is 120x120x85 mm. Model with display and without logger has depth of 55 mm. The counter operates by detecting the change in radio signal when the radio beam is broken by a person passing between the units. The units can be set up to 15 metres apart. The radio beam passes
through thin wood and plastic and can be hidden behind signs and in camouflaged boxes etc. The counter operates under all weather conditions and has very low battery requirements. Under normal conditions the batteries will last more than 100 days using alkaline batteries, or up to 200 days using lithium batteries. The basic model of the counter has a receiver with a detachable internal logger storing the data. There is another model with a count display that shows the total number of people passing. You can also obtain the receiver with an internal logger combined with the display. The counter with display has a slightly higher power consumption, and the transmitter operates on six AA size batteries. The transmitter has a single red LED-indicator for battery check. If the LED turns on with a magnet in place above it the battery is OK. The receiver has two LEDs, one for battery check and one for alignment with the transmitter. The counter has a long pulse width reject function which can be set to ignore signals when the radio beam is broken for more than a specific time. With this function the counter ignores counting e.g. horses because they break the radio signal for longer than pedestrians.

**How were the counters located and why were these locations chosen?**

There were three locations on narrow roads in the area. They were chosen to compare the frequency of visitors from different entrances to the area.

**Amount of working time required**

An example: March – December 2003, total time required 33 hours.

**Price of the methodology**

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**Evaluation of the technical functioning of the equipment**

Good

**Evaluation of the reliability of the results**

Good reliability for the counter.

**How has the information been used or is being used?**

Politicians have been informed about the results in order to make them aware of the value of the area for the people. The manager uses the results for planning and information.
**Evaluation of the successfulness of the study: strengths and weaknesses?**

No problems with the counting, but too short counting period. The aim of the counting was just to test the equipment and get an idea of visitor-flows.

**Level of the monitoring programme on a scale by Hornback and Eagles 1999?**

II –

**Recommendations for the next time, if somebody was to implement this counting in a similar kind of setting.**

**Reference**

Most of the counts have been made for experimental purposes and have not been published.

Counts in 3 places during summer and autumn 2003 are shortly referred to in a report on the management of recreational areas, which will be published in January 2006. There is a handbook published by The Swedish Environmental Agency both in Swedish and in English on how to use the Radio Beam Counter (Naturvårdsverket 2005a, 2005b).
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Web site: http://www.nature.nps.gov/socialscience