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The Finnish Wilderness Experience



Ville Hallikainen

ROVANIEMI RESEARCH STATION

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Ville Hallikainen

Academic dissertation

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We have now statutory wilderness areas in Finland, but the statutory wilderness concept is not necessarily similar to that of "social wilderness". The concept of 'social wilderness' means that the wilderness is rather a 'mental image' formed by the culture than the ecological system. In this study, the social-cultural approach has been used to find out the Finnish wilderness concept and the characteristics in the Finnish nature enhancing wilderness experience.

The cultural roots of the Finnish wilderness concept lie in the source of livelihood practiced in southern and central Finland during the Middle Ages. During that time, hunting and fishing were important for survival. The Finnish word "Erämaa" (wilderness in English) has meant forest covered hunting and fishing areas located well away from village borders and neighboring agricultural lands. To find out the present features of Finnish "social wilderness", a questionnaire was sent to 2000 Finnish people selected randomly in 1990. Questions dealt with people's mental images of the wilderness and the evaluation of the objects that were produced by person's mental images, their use of these areas and their attitudes towards wildernesses.

Another data set was collected by showing slides of 54 forest stands to the samples of people and asking them to assess the value of the stands for scenic beauty, outdoor recreation and wilderness character using the scale from 0 to 10. The biological characteristics of the forests were measured. In addition, another questionnaire resembling the postal questionnaire was also used. The samples of this data set consisted of 359 randomly collected people and they were met in different places in Finland. The commonly used statistical methods have been used to find out the results.

The results reveal that the first mental images of wilderness according to both of the data sets are roadless, uninhabited areas covered mainly with virgin forests. Mire, especially in its natural condition, has been mentioned fairly often as well. Wilderness areas must be silent. They must lie rather far away from roads and inhabited areas. In general, the area should be close to its natural condition. The expressions of people with different background were astonishingly homogeneous.

The Finnish wilderness is not an on-off kind of concept. It is rather a continuum. Clearcutting areas and young forest stands do not bring to mind a wilderness. Thinned forests with mature Scots pine or Norway spruce stands carry quite a lot of the wilderness character. Virgin coniferous or coniferous-dominated mixed forests are the best. The main characteristics enhancing the wilderness character of a forest stand are the number of dead trees, the amount of epiphytic lichens and the volume of the stock . It seems that spruce dominated forests, often with a high proportion of deciduous trees,

are little better for the wilderness experience than stands dominated by Scots pine. The latter mentioned stands are considered as rather beautiful and are evaluated as suitable for outdoor recreation. Furthermore, (open) mires are very important for the Finnish wilderness experience.

Streams and ponds are also an important part of the Finnish wilderness. In addition, some old cultural elements, such as little meadows with an old shed and an old gray wooden cottage in the forest used by occasional hunters are consistent with the Finnish wilderness concept. Paths and fireplaces and some constructions for outdoor recreation are not regarded as very disturbing. Roads and winter tracks for timber transportation disturb the wilderness experience considerably.

The traditional use of Finnish wilderness can be seen in the activities of wilderness recreationists. Furthermore, Finnish people are rather keen wilderness visitors; about half of the respondents have visited wilderness. Moreover, the respondents expressed that they support wilderness conservation. The most important reasons for conservation, according to the respondents, were the conservation for future generations, the conservation for endangered species and the importance of wilderness areas for outdoor recreation.

Keywords: wilderness, wilderness experience, wilderness landscape, outdoor recreation

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Preface

The discussion about the management and use of the Finnish wilderness areas in the end of 1980's pushed this study process on. The Finnish Forest Research Institute and the Faculty of Forestry of the University of Joensuu expressed their interest to study the issues of wilderness concept and wilderness use and management. I am grateful that these organizations gave me an opportunity to study the issue by their knowledge and financial support since 1990. After working in the Finnish Forest Research Institute, Rovaniemi Research Station for several years, I began my work as a lecturer in Rovaniemi Polytechnic, Department of Forestry. Consequently, I want to express my best thanks to the latter mentioned organization and my colleagues for their support.

My own interest towards the issue arises from my childhood in Inari, in the northernmost Lapland, were I have lived in a remote place without any road connection with the nearest village, about ten kilometers away from my home. Nearly all my life my interest has been hiking around the wilderness areas of Finnish, Swedish and Norwegian Lapland. Besides my nature interests, my interest towards philosophy and statistical analysis may be seen in this study as well.

The aim of this study is to search for a solution particularly to the problems in the management of wilderness forests. However, the approaches in this work use several traditions of science, such as environment sociology, psychology, philosophy and nature sciences. Furthermore, my aim has been to make the chapters of this work as their own entireties that would be rather easy to read even separately, without reading the whole publication. Moreover, I have tried to write the results as shortly as possible tightening the information of many tables, figures and statistical analysis in the text. A great number of tables and figures have been included in the text, because a reader who may be very interested in the issue would thus have an opportunity to obtain more detailed information by reading the tables and figures carefully compared with a person who reads only the text.

Besides my wife Satu, my cat Laikku and my friends, there are several persons to whom I want to express my best thanks for their help and support during the process. I want to express my best thanks to Ph.D., docent Pentti Sepponen and D.Sc.(For.), professor Seppo Kellomäki for guiding and supporting me during my work from the very beginning to the presentation of the dissertation. Further, many thanks to D.Sc.(For.), professor Olli Saastamoinen, D.Sc.(For.), docent Jyrki Kangas, philosopher Seppo Lohiniva, D.Sc.(For.) Martti Varmola, L.Sc. Jarkko Saarinen, L.Sc. Anna-Liisa Sippola, Ph.D. Jukka Jokimäki, L.Sc. Liisa Kajala and M.Sc. Teppo Loikkanen for their advise and other help. Particularly Seppo Lohiniva lead me to the ideas of many philosophers, I am very grateful to him. Forestry

engineer Reino Kallio helped me win my fear towards computers. In addition he selected and measured the forest stands. I want to express my best thanks to Reino. Furthermore D.Sc.(For.) Hannu Hökkä, M.Sc. Kari Mikkola, M.Sc. Virpi Alenius, B.Sc. Juha Hyvönen, M.Sc. Risto Häkkinen and Ph.D. Hans Helenius gave me valuable statistical advise. Best thank to all of them. First of all, I want to thank B.Sc., forestry engineer Jouni Puoskari, a man who made the phone interviews, arranged and lead the slide shows, read all the narrative literature and collected the wilderness expressions in the texts as well as helped and supported me in all the stages of the work. Furthermore, forest technician Jouko Kyrö, Mr. Jouni Hilke, Mr. Kari Hämäläinen and the personnel of Kairosmaja, Riekonkieppi and Kultakero, forestry engineer Rauno Karppinen, Mr. Teuvo Niinikoski as well as the members of Alastaro Hunting Society, Mr. Timo Lipponen and the personnel of Rovala as well as the personnel of the Center for Adult Education in Rovaniemi helped us in the arrangements of the data collection by giving their support during the slide shows. Moreover, I am very grateful to Ms. Eija Virtanen and Mr. Raimo Pikkupeura for their devoted work for layout and other finishing touches of the work as well as to M.Sc. Philippa Zoë Kettlewell and M.Sc. Ulla Lajunen-Tuokko who made very valuable work correcting the English language. And finally, without those friendly people who responded to the questionnaires, this work would have not been finished. I want to express my best thanks to all of you.

My thesis is dedicated to the memory of my parents who acquainted me with wilderness.

Rovaniemi, 25 November 1998

Ville Hallikainen

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1 Introduction

People all over the world are increasingly concerned about the effects of human activities upon original nature. In the United States, the home country of wilderness preservation activities, the discussion about wilderness preservation already began in the end of the nineteenth century strengthening remarkably after the Second World War. One reason for the discussion was the rapid destruction of wilderness areas in the United States after the settlement of the continent by pioneers (Borg 1984, Hart 1984, Hendee et al. 1990). Changing of the wilderness areas into cultivated and grazing lands became an important part of the national culture and identity of the United States. The appearance of the Romantic wave with its different relationships between human beings and nature, compared with classical thinking, promoted the understanding of wilderness preservation as a part of American culture and lifestyle (Short 1991). When puritan attitudes towards working gave way to the understanding of leisure activities, the importance of wildernesses for recreation activities was emphasized. The wilderness movement was organized in the United States in the end of the eighteenth century when the Wilderness Society and the Sierra Club were founded (Reunala & Heikinheimo 1987). The enactment of the first Wilderness Act in 1964 with some other regulations was an important part of wilderness preservation in the United States.

In South and Central Europe, where culture has changed nature for centuries, the original forests have been completely cut or changed into cultivated or grazing lands or urban areas. The change, however, happened gradually already a long time ago (Dorst 1982). On the other hand, in some European countries such as in Germany and France, the multiple use of forests and nature conservation has long traditions (Borg 1984, Reunala & Heikinheimo 1987). In fact, real wilderness preservation has not taken occurred in South and Central Europe. Nowadays the remainders of some wilderness areas can be found in some rugged coast and mountain areas (Dorst 1982).

In the Scandinavian countries, such as in Finland, Sweden and Norway, there are still areas where the wilderness character left (Dorst 1982). The recreational use of nature has developed in these countries powerfully in 1960s and 1970s (Reunala & Heikinheimo 1987). Since these times, increasing attention has been paid to forestry activities and, gradually, to wilderness preservation as well. The discussion surrounding these issues has occasionally been heated with the appearance of some public demonstrations arranged by nature activists. In Norway, the fights for forest and wilderness preservation has not occurred in the same level as in Finland or Sweden (Erämaakomitean mietintö 1988, Reunala & Heikinheimo 1987,

Erämaakomitean mietintö 1988). The vast mountain areas in Norway have ensured that large areas have been left without human touch.

In Sweden, the effects of forestry activities on nature, and the need for preservation of vast continuous areas in their natural state has been under thorough discussion since the 1970s. In 1977 the discussion produced the decision to preserve fourteen of the most important wilderness areas as base areas for traditional sources of livelihood such as reindeer grazing and hunting. The total area of these areas is ten percent of the area of Sweden (Vilborg 1982, Reunala & Heikinheimo 1987). After the so-called "Naturresurslagen" was enacted in 1987, 13 fell and mountain areas have been conserved in order to preserve their wilderness character (Sippola 1989). In 1980s the discussion has concentrated on forests that are situated near forest or tree line on mountain slopes, and on virgin forests in general. In the discussion the ecological, social and cultural values of these forests have been emphasized (Andersson 1981, Olsson 1981, Sveriges naturvårdsförbund 1981, Lundqvist 1987, Wramner 1987).

In Finland, a famous explorer, A. E. Nordenskiöld was the first person who expressed his concern about the preservation of wilderness areas in the end of the nineteenth century. His speech was an important benchmark in starting the discussion about wilderness preservation (Borg 1984). Although there were many national parks in Finland resembling wilderness, the vivid discussion about the need of the designation of the statutory wilderness areas actually started in the 1960s. In 1973 the Committee for the Designation of the Outdoor Recreation Areas published its work. In the publication, there was a suggestion to enact the Wilderness Act (Virkistysaluekomitean mietintö 1973). This suggestion did not, however, lead to the enactment of the law. Another suggestion for wilderness conservation by some kind of Wilderness Act was made by the committee for the designation of the national parks (Kansallispuistokomitean mietintö 1976). Wilderness areas were suggested to be established besides some new national parks. After that, the Ministry of Interior suggested preservation of the six wilderness areas in Finland (Sisäasiainministeriö 1982). One important promoter of the discussion was a study made by Oinonen (1983). The study revealed that wilderness areas that have been determined by using the so-called "eight kilometers rule" (see Häyrinen 1984) have disappeared very fast. The wildernesses were found only in Northern Lapland.

The discussion became more lively in the end of the 1980s when an area in northern Lapland was designated to be cut using the forestry methods at the time. The area was part of the state forests administrated by the Forest and Park Service and it was called Kessi-Vätsäri (Lehtinen 1991). This was also the beginning of the Wilderness Movement in Finland. Members of the Wilderness Movement emphasized the ecological, cultural and recreational values of the virgin forests as well as the importance of these forests for the traditional sources of livelihood. Their opinion was that these values could

be lost if that time's cutting methods were used. The methods were considered as rather one-sided. The Saami people's rights to the area were also under discussion. The representatives of the Forest and Park Service regarded the things in a rather different way. They emphasized the importance of cutting for employment and believed that recently developed forest cutting methods take the demands of multiple-use and nature conservation into account sufficiently. A picture of the debate has been drawn quite well in a book entitled "The letters from Kessi" (Puikko et al. 1988, eds.).

The wilderness discussion led to the establishment of the Wilderness Committee in 1987. The work of the committee was published in 1988 (Erämaakomitean mietintö 1988). According to the suggestions of the Committee, the Wilderness Act was enacted in 1991 (Erämaalaki 1991). According to the Act, twelve wilderness areas were established in northern Lapland.

The wilderness discussion was important in revealing the importance of wilderness research. The research can contribute to both social and ecological points of view. Particularly the lack of the results in social research as a basis for wilderness management was found (Hallikainen & Jokimäki 1992). Economic, social and psychological research have to be increased to understand attitudes and values which are connected to wilderness areas and their use (see also Veijola 1992).

From the social point of view there were features in the discussion and the reactions that characterized the phenomenon as a social one. For example, the features like the rationality and similarity of the arguments in the discussion, and the possibility to identify the threats that were rather universal. The background and the development of the phenomenon were also easy to follow (see Allard & Littunen 1979, Mills 1982, Massa 1983, Reunala & Heikinheimo 1987, Salwasser 1990, Smyth 1990, Lehtinen 1991). However, there were not very many research results of environmental sociology available to be applied in the wilderness context. Furthermore, many results of environmental sociology have been considered as having a lack of theory or having only few connections between the theories and empirical results (Lowe & Rüdig 1986, Massa 1991, Moisseinen & Rannikko 1991). Ethics has also become an important part of environmental discussion (Vilkka 1995). The discussion about wilderness conservation includes these features. Also, the changing attitudes towards pristine nature in general during the last few centuries provides an interesting point of view (Short 1991).

To understand people's values and attitudes towards wilderness, it is important to determine the concept of wilderness and the wilderness characteristics that promote experience. It is not sure that people's mental images about wilderness are similar to the features that are described in the Wilderness Act (Asmus & Kearney 1990). After we know the mental images it is possible to manage the wilderness areas in a way that these management activities do not seriously disturb wilderness experience (Hallikainen & Jokimäki 1992).

In the United States, wilderness research has a longer tradition than in other countries. The research has included the issues of natural and social sciences. Social research has continually increased its importance, expanding from visitor studies to the studies of deep understanding, modeling and valuing of wilderness experience. (Lucas 1987). Conflicts between different groups of wilderness users have been emphasized. Furthermore, the importance to integrate different approaches and scientific traditions has been noticed (Hendee & Evert 1993).

Nature tourism, nature-based tourism, nature-oriented tourism or ecological tourism are new and still vague concepts in which the role and the attraction of nature and preserving the nature are emphasized (see Butler 1991, Krippendorf 1991, Lindberg 1991, Lohiniva 1995). Vast nature areas, and particularly wilderness areas, are important for this growing form of tourism (e.g. Hunt 1990, Kortesluoma 1990, Boo 1991). Nature is the main attraction of the tourism being directed towards Finland, Sweden and Norway (Brinchman & Huse 1991). Tourism is economically important at a national and a regional level. Especially in the economy of remote districts, the role of nature-oriented tourism may increase its local importance (Veijola 1992). For example, the incomes received from tourism in Lapland are estimated to be 1.4 billion Fmk a year. Although the income received from hikers and trekkers is estimated to be only 20 million Fmk in Lapland (Södervall & Tekoniemi-Selkälä 1993), the bigger portion of the tourism income is due to the attractiveness of Lapland's (and Finland's) wild nature (see Haahti 1986, Aho 1994). Furthermore, Kauhanen (1988) has estimated that the economical importance of the wilderness areas based on the Wilderness Act (Erämaalaki 1991) is 10 million Fmk per year. Additionally, the wilderness areas are important for local recreational use of Lapland's inhabitants as well (Lyykorpi 1989).

Finally, this study addresses the following topics:

1) The intensive discussion about wilderness management in Finland.
2) The lack of current research results to solve the problems of wilderness management in the wilderness areas based on the Wilderness Act (Erämaalaki 1991) and the other areas with the wilderness character.
3) The increasing importance of nature-based or nature-oriented tourism.
4) The need to develop a theory to understand wilderness experience as well as to develop and test the methods to identify wilderness characteristics, mainly at the forest stand level.

2 The cultural roots of the concept of wilderness and the theoretical background of wilderness experience

2.1 The approach

The aim of this chapter is to clarify the Finnish wilderness concept as revealed by previous, mainly scientific, literature, and to compare the concept with the wilderness concept of some other cultural traditions and cultural stages. Furthermore, an important task is to develop theoretical background to understand the wilderness experience as an environmental experience and define the wilderness experience that is described in the literature.

The definition of the concept of wilderness is an important step in wilderness research. Without the concept it is not possible to point out where the wilderness areas are situated and to direct the wilderness research. It is, however, very difficult to define the concept exactly. Many suggestions and conventions have been made and some laws have been passed to define the concept of wilderness. However, one can ask how well these definitions fit together with the mental images of people (Asmus & Kearney 1990). If the mental images, with the possible variations in these images, in defining the concept of wilderness are emphasized, the concept can be defined as the "social wilderness" (Nash 1982, Hendee et al. 1990). If the cultural background of people is similar, it is likely that the mental images of people are rather similar and they share a similar definition of the concept.

Approaches to the concept of wilderness can be biological, social or cultural. In this study, social and cultural approaches will be used. Thus, the basic idea is that wilderness is a mental image formed by culture rather than an ecological system (Tuan 1974, Ovington & Fox 1982, Nash 1982, Thompson 1987, Hendee et al. 1990, Short 1991). This does not mean that the ecological responses that meet the images cannot be found in the real world. Merely this means that the concept cannot be defined based on the ecological system. In the following sections, different wilderness definitions are compared with each other.

2.2 The "social wilderness" in human minds and cultures

2.2.1 Wilderness as a religious concept

The concept of wilderness has also been included in religious vocabulary, in which the concept has both concrete and symbolical meanings. In the Judeo-Christian literature wilderness has been described as a vast, uninhabited, desolate, barren and infertile land (Short 1991). To go to wilderness is on

one hand a trial and on the other hand blessing because wilderness can purify the soul and ennoble a person. For Nouwen (1986), wilderness symbolizes a lonely, barren desert of mind that has to be changed into a fertile and flowering garden. This symbolism is closely connected to the classical and Christian thinking: wilderness is something that has to be changed into something else. At present, the Christian thinking has perhaps another, more positive, attitude towards wilderness (see Lepistö 1997). On the other hand, in the Jewish tradition wilderness denotes a holy place with the meaning of the liberation from the oppression that Jewish people met. Van der Post (1982) describes wilderness as a cathedral as well. Furthermore, according to Roman and Germanic traditions, wilderness is a spiritually important place. According to these traditions, wilderness is a place of mental and spiritual renewal (Tuan 1974, Nash 1982, Thompson 1987, Hendee et al. 1990, Rolston 1990, and Wikström 1995). According to Fromm (1977), wilderness that has been described in the Old Testament symbolizes unconcerned life that is free from the pressures caused by property. In this kind of life, the spiritual dimension of life is emphasized.

In the religious vocabulary, there is a Russian word *Poustinia* meaning a desert or a wilderness. In its spiritual meaning, the area can, however, be a forest area, mountain area and so on. Furthermore, *Poustinia* is a place for prayer, penance, mortification, solitude, silence, atonement and reparation. First of all, *Poustinia* is a state of mind rather than a place. A person can visit *Poustinia* anywhere he is (de Hueck Doherty 1990).

2.2.2 The Anglo-American wilderness

American culture and the way of thinking carry old Central European traditions. In old European thinking, areas of human touch have been appreciated. In the Southern European tradition, wilderness has been regarded as a very dangerous place (Nash 1982, Short 1991). If it had some value, the value was the role of the wilderness as a raw material for human needs. Wilderness had to be "changed into a garden".

The components of the word wilderness are will-der-ness. The first component, "will" describes a creature that has a strong will, an uncontrolled creature. In the old English language, a word "deor" (the old form of the second component, "der") denotes an animal that is impossible to control. The third component, "ness" is the substantive-like ending of the word. Thus, the word wilderness can be interpreted to denote an area that is filled with the wild animals (Nash 1982). On the other hand, the root words of the word wilderness could be the Old-English words "weald" or "waeld" denoting forest.

This old European thinking characterized the thinking of the American frontiers as well. For them, wilderness was something to change for their needs. Indians were regarded as a part of wilderness, and their culture not as

a human culture that would be worth retaining (Brant 1982, Short 1991). The Romantic wave in the end of the nineteenth century changed the attitude towards wilderness. The Sierra Club, an organization founded in the end of the nineteenth century in the United States, expressed its appreciation towards wilderness and wanted to retain wilderness. The ideal of wilderness according to the Sierra Club was an area of at least 400 000 hectares in its natural condition, an area where a human being could hike for two weeks without meeting his old footsteps (Erämaakomitean mietintö 1988). Furthermore, a well-known American wilderness enthusiast, Aldo Leopold (1921) defined wilderness as a roadless, uninhabited area being vast enough for a two-week hiking trip. According to him, hunting and fishing should be allowed in the area. Moreover, according to Leopold's ideas wilderness is a raw material for culture (Leopold 1921, 1949/1990). Wilderness has become the "living history" of the United States, and even an appreciated part of it (Thompson 1987). Being a part of culture, wilderness is, however, out of the dominant cultural stage, being thus considered as "an unknown area" (Hendee et al. 1990).

The concept of "wild land" has been met in the United States as well. Besides wilderness areas, this concept includes commercial forests, recreation areas and rangelands. The concept does not include industrial areas, inhabited areas or cultivated lands (Randall & Peterson 1984). Thus, demand for naturalness among these areas is not so strict compared with the demand in the wilderness areas. It has to be mentioned, however, that the concept of naturalness is not easy to define (Wohlwill 1983).

2.2.3 The cultural roots of the Finnish concept of wilderness and comparisons with other Scandinavian concepts of wilderness

The cultural roots of the Finnish concept of wilderness lie in the sources of livelihood during the Middle Ages and the ages before. Even 7000–1000 BC there were hunter communities living in their winter and summer villages. After these times, from 1000 BC to 1000 AD, slash-and-burn agriculture as well as primitive livestock rearing spread gradually into the country. At least partly because of the conditions of nature, slash-and burn agriculture dominated in the eastern part of the country. With agriculture communities became increasingly sedentary. Hunting and fishing traditions however, continued, in the vast remote areas left outside human touch (Sarmela 1989).

During the Middle Ages, hunting and fishing were very intensive sources of livelihood, especially in the Finnish district of Häme, where hunting and fishing became an important social institution having been preserved in the historical documents describing the institution. The hunters and fishermen who lived in the district of Häme, traveled far to the north to get fishes and

game. Small animals like birds and fur animals formed the most important part of the game. Furs became commercially important during the Middle Ages. This period of commercial hunting of fur animals was the most flourishing period of the so-called "hunting period in the county of Häme" (hämäläinen eräkausi in Finnish, Voionmaa 1912, 1947). Hunting and fishing areas were, at least partly, divided by the hunters and fishermen. Although the hunters and fishermen did not own the areas, they had the right to use the areas and they paid taxes for the areas. Fights over the areas occurred. With an increasing population of human beings, decreasing populations of fur animal and the spread of cultivated areas, this intensive hunting period gradually terminated by the end of the Middle Ages continuing only in some remote districts in Karelia and Lapland (Voionmaa 1947).

The contrast between the cultural stages was not very sharp in Lapland, where a hunter-gatherer life style continued until the eighteenth century. In the seventeenth and the eighteenth centuries, the settlers who came to Lapland from other parts of Finland brought a new way of living to Lapland. The Saami inhabitation became more localized with the penetration of Finnish culture into the northernmost part of the country. At the same time, the importance of reindeer husbandry increased with the decreasing importance of hunting (Voionmaa 1918, Itkonen 1948/1984).

Thus the Finnish word *Erämaa* (wilderness in English) has meant forest-covered hunting and fishing areas located well away from village borders and neighboring agricultural lands. Besides the word *erämaa* also the words like *päiväkunta, oravimetsä, pilkottu* or *eräsija* were used in describing the hunting areas (Voionmaa 1947).

The word *erä* has many meanings (Nykysuomen sanakirja 1982). The oldest meanings of the word were a crop, a fruit, a profit, a game as well as a hunting or fishing trip. Furthermore, the word has meant, for example, "a part" or "a part separated from something else." In Estonian language *erä* also means "away" (*ära*). The Saami vocabulary has a word *aerre*, which means "the amount of milk that a cow or a reindeer gives per milking". According to Oinonen (1988) the word *erä* also denotes the sharing of game among the group of hunters after hunting activities.

Rapola (1947) mentions four meanings for the word *erämaa*, these are: an uninhabited area; a forest covered area or *korpi* (a mire covered with Norway spruce and/or deciduous trees); an area remote from settlement; an uncultivated area; or an area that is gradually returning to its natural condition after cultivation activities have come to an end and the area has been abandoned. The word has also been taken into the official Swedish vocabulary with the meaning of an area used for the sources of livelihood (*erämark, eremarcken, eriemarker* and so on). Perhaps the oldest meaning of the word is an area separated from the others (Nykysuomen sanakirja 1982).

Thus the word *erämaa* can mean a hunting area divided by hunters, or the word may point at the game divided by hunters. Moreover, *erä* may mean that these areas were separate from cultivated areas. Perhaps the development of the agricultural settings, the new cultural stage, made it possible to define the concept of *erämaa*, the areas outside the new cultural stage. As Goffman (1986) has argued in his frame analysis, concepts take their shape against the frames. Although Goffman's work dealt with micro sociological settings, theoretical connections with the origins of the Finnish concept of wilderness are interesting.

The previous thoughts fit rather well with the ideas of Tarasti (1981, 1990) who has analyzed wilderness landscape in the works of art using a semiotic approach. He classifies, for example, Pekka Halonen's painting named *Erämaa* as a "positive landscape outside the dominating culture". This contrast has increased with increasing urbanization (Tuan 1974, Lehtinen 1990).

One can, however, ask if the cultural roots of concept of wilderness are the same in *Sweden and Norway*? In the southern part of Sweden, agriculture took its place very early, while in central and northern parts of the land, where vast forests and mountains dominated, hunting and fishing retained their importance as long as in Finland. Most Swedish forests were colonized by Swedish peasants. This was the situation even in Sweden's northernmost district, Norbotten. Just after the colonization, hunting and fishing were an important part of the peasants' source of livelihood (Dahlgren 1965). At least in Norrland, peasants had their own "hunting paths" like in Finland (Lundemark 1984). With a growing population density in Sweden, other sources of livelihood took place there. However, in the Middle Ages skins and hides of wild animals still played an important role in the trade markets of central and northern Sweden (Björnstad 1965).

The colonization of Swedish forestlands forced the Saami people to escape to the fell and mountain areas. The usage of the fell and mountain areas, to the north of the so-called "cultivation boundary", have been divided by Saami villages. These areas with little forestlands were the hunting and grazing areas of the Saami people with their reindeer herds (Cramer 1965). It has to be noticed that the State owned these areas. Saami villages had the rights to use them. Similar to Sweden, most fell and mountain areas in Norway were used and inhabited by Saami people. Fishing and agriculture have been, and they still are, important sources of livelihood in fjords (Brox 1965). However, there has not been the same kind of commercial hunting tradition by peasants in Norway as there has been in Sweden, and especially in Finland. This is mainly due to the harsher conditions of nature in Norway.

All in all, although some differences in old traditions in wilderness usage between Finland, Sweden and Norway are found, at least Finland and Sweden are quite alike. Thus the basis for the wilderness experience in these countries is also quite similar.

2.2.4 The concept of wilderness based on conventions and regulations

The basis of the "official" concept of wilderness in the United States was formed already in 1929 when the guidelines of the wilderness policy of the United States' Forest Service were described in the so-called L-20 regulation. The regulation allowed a rather intensive use of wilderness areas that were listed under the regulation, for example, forest cuttings, road building and grazing were allowed in many areas (Stankey 1990).

The weakness of the L-20 regulation in preserving wilderness areas led to its replacement with the further U-regulations (U-1, U-2, and U-3) in 1939 (Gilligan 1954). Regulation U-1 established wilderness areas of at least 100 000 acres, regulation U-2 established areas between 5 000 and 100 000 acres and regulation U-3 dealt with the areas that were managed mainly for recreational use. Timber cuttings and road constructions were allowed in a few U-3 areas if they were provided for in area management plans (Gregory 1987, Stankey 1990). In general, the U-3 regulations prohibited timber cutting, road construction, summer cottages, hunting camps and mechanical access, except if they were well established or in emergencies. Grazing and water resource developments as well as mining were allowed to continue in the areas (Roth 1984).

The Wilderness Act was passed in 1964 in the United States. The law states (ref. Stankey 1990):

> A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.

In the law, "untrammeled" means that an area is not subject to human control and manipulation, and that natural forces can work freely. Furthermore, the wilderness has to serve outstanding opportunities for solitude or a primitive or unconfined type of recreation, and the size of an area has to be at least 5 000 acres, which is about 2200 hectares. The criteria of naturalness and solitude are the distinguishing qualities of the areas classified as wilderness (Stankey 1990).

The minimum size of the wilderness area varies from one country to another. In Australia the minimum is 25 000 hectares and it takes a half day's walk (about 10 kilometers) from the nearest road to get into the wilderness. In New Zealand the minimum is 20 000 hectares and it has to take

at least two days to walk through wilderness. In Sweden the minimum is 50 000 hectares (Erämaakomitean mietintö 1988). Construction of new roads or railways is prohibited without the government's permission in Sweden. Furthermore, large-scale water resource developments for electricity production, and constructions for electricity transportation systems are prohibited as well as mining and forest cutting with some exceptions. There is not a special law for wilderness preservation in Sweden, but the idea of wilderness preservation is included in some laws (Sippola 1989).

In the Finnish Wilderness Act (Erämaalaki 1991), wilderness has been defined as an area of at least 15 000 hectares. In general, the breadth of an area has to be at least 10 kilometers. Furthermore, an area has to be roadless and the landscape natural-looking and entire. The ecosystems of an area have to be versatile and function naturally. An area can include pristine nature, and zones that are managed according to the principle of the natural succession. Human activities have to fit into the function of ecosystems to retain the wilderness character. Research activities, recreational use and some old cultural sources of livelihood like hunting, fishing and reindeer husbandry are allowed as well as forest cuttings using cutting methods that would preserve the wilderness character rather well (Erämaakomitean mietintö 1988, Erämaalaki 1991, Metsähallitus 1991).

A definition of wilderness from the 1960s used in many countries is the definition according to which a wilderness area has to be situated eight kilometers from the nearest road. Thus, it takes a half-day's walk to get into the wilderness. In addition to this buffer zone, the core area of wilderness has to be vast enough. The size of this core area differs from one country to another (Häyrinen 1984).

The World Wilderness Congress held in 1983 and the National Park Committee working for the International Union in Conservation of Nature and Natural Resources (IUCN, 1987, ref. Erämaakomitean mietintö 1988), defined the wilderness as a vast, roadless, pristine, uninhabited, remote and peaceful area with beautiful landscape and permanent statutory protection. In addition, wilderness has to be valuable for research and education as well as physical and mental health. Old traditional sources of livelihood and other activities that do not disturb the functioning of nature are allowed. According to the IUCN (1985), the wilderness zone is an important zone in national parks. Non-mechanical access is allowed with some restrictions in the wilderness zone. Furthermore, the number of visits can be restricted and there should be few constructions for visitors.

Although statutory wilderness concepts, or the concepts based on other regulations, differ from each other, some common features can be found such as: natural, uninhabited, roadless and vast areas. The cultural context behind the concept varies from one country to another. The cultural variation may influence wilderness experience as well.

2.3 The wilderness experience as an environmental experience

2.3.1 The formation of an environmental experience and the possibilities to study it

It is likely that the concept of wilderness is related to wilderness experience: the concept influences the experience and, on the contrary, the experience gives shape to the concept.

The term, *experience*, can be defined in many different ways. In commonly used language, the term can denote a single event experienced by a person (Nykysuomen sanakirja 1982). The psychological approach emphasizes the subjective evaluation of an event and the cognitive information produced by the event. In an experience, a stimulating object, a perception or an imagination is met, found, lived through, felt or a person becomes aware of the object (Wilson 1972). Furthermore, experiencing environment is an interactive process between a person and an environment. In that process a person is not a subject or an object, but merely a participant. Experiencing environment is thus an active process. The stages of that process are observation and perception, cognition and evaluation (Horelli 1982).

Many modern people have found the wilderness experience as a valuable experience (Kaplan & Talbot 1983, Schreyer & Driver 1990). It is, however, apparent that wilderness experience is a personal experience that is lived through deeply by a person, and the experience has many dimensions. Furthermore, it is evident that the quality of the environment (the right side in Fig.1) as well as a person's social and cultural background (the lower left side in Fig.1) are important factors having an effect on the wilderness experience. A person's former experiences and his or her cognitive dimensions are important aspects of this background. The social and cultural background and also a person's inherited (genetic) character (the upper left side in Fig.1), modifies a person's values, attitudes and expectations about a situation. Furthermore, a person's state of mind may modify the experience from one situation to another (near the middle of Fig.1, see also Karjalainen 1990a). Schreyer et. al (1984) and Stankey & Schreyer (1987) found a person's former experiences to be evident on his or her wilderness images and wilderness experiences as well.

The role of a person's inherited background on the wilderness experience is not disputed. According to the evolutionary approach, the nature experiences of different person's are rather similar, determined by the genetic background. Thus they do not depend on a person's cultural background, and a person's senses have been adapted to receive the stimuli produced by nature (e.g. Kaplan 1977). On the other hand, the cultural approach emphasizes a person's cultural background in the relationship between a person and nature, and a person's way to experience nature. According to the latter approach, experiencing nature is thus relative (Anttila

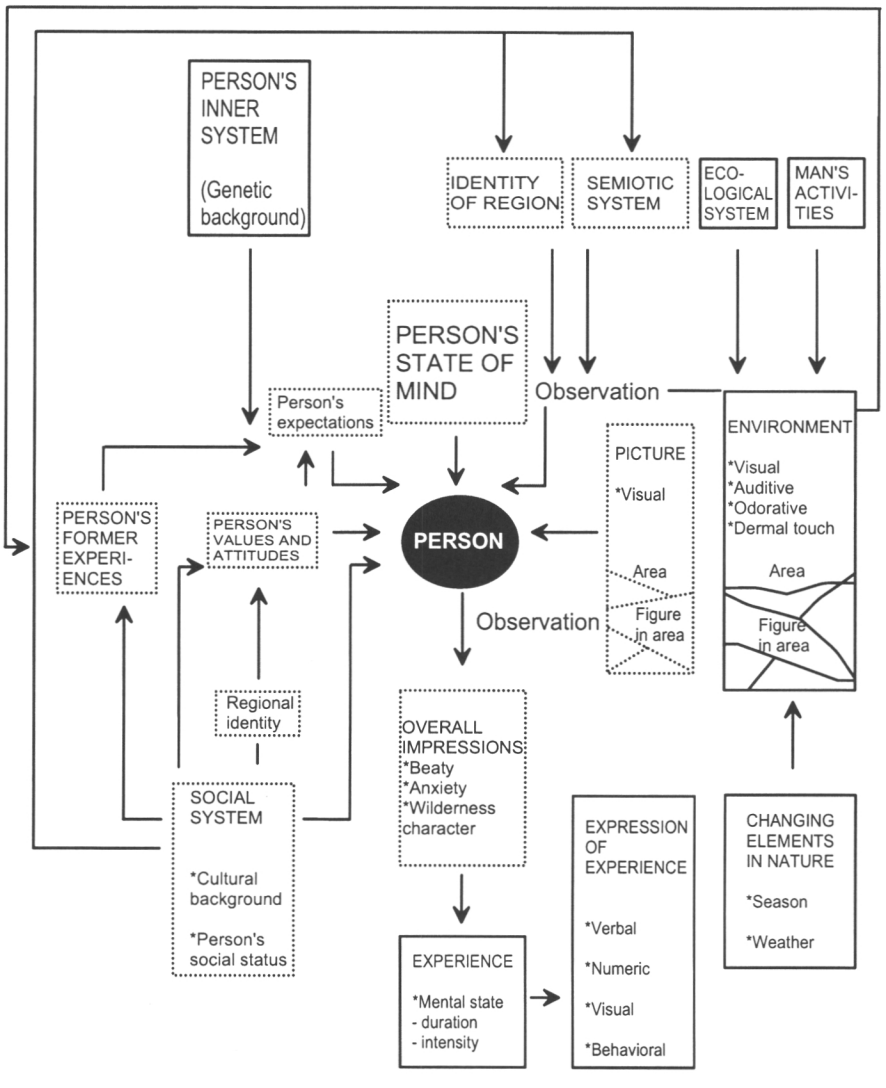


Fig. 1. Environment experience and its expression (Hallikainen 1993).

1989). Because the term *erämaa* (wilderness) has a very deep cultural and historical background, it is apparent that the images about wilderness and wilderness experience are strongly culturally defined among Finnish people.

Cultural differences have to be considered temporally and locally. The people living in different cultural "stages", such as pre-modern, modern and postmodern, may experience wilderness in rather different ways. The stages are met both locally and temporally. For example, the people who live in primitive cultures perceive their environment in an all-inclusive way compared with the urban dwellers (Arsenjev 1976, Pälsi 1920/1983, Anttila 1989, Oelschlager 1991).

The difference between classical and romantic approaches towards nature is closely connected with cultural stages as well. In art, classicism has been considered as perfect but romanticism as lacking balance and imperfect. Classicism is cold and artificial, romanticism is pure, warm, powerful and truly expressive (Croce 1972). Romanticism has established its position during the last two centuries. According to the classic approach, wilderness was opposite to the civilized human world. According to the romantic approach, pristine nature is sacred and the most real thing that we have (Short 1991). Furthermore, in addition to different cultural stages, the effect of different religions and nationalities on the wilderness experience may be remarkable (Brant 1982, Ovington & Fox 1982, Mabuza 1982, Kaplan & Talbot 1983).

According to Paasi (1984, 1986), the regional identity of a person (Fig.1) can be an important part of his or her social background as well. It can be said to be a way of thinking, "a uniform spirit upon a region." Paasi (1984, 1986) has also used the concept of the identity of a region (Fig.1). Some regions may have a special identity that makes the region different from other regions. The identity can give an extra status for the region. For example, Koli National Park is not just a hill in North-Karelia. It is also a famous national landscape portrayed in many paintings and photos. Besides these commonly accepted "special places", an "ordinary place" may also have a special meaning to a person. The person has been attached to the place. When he of she is visiting the place, the reason for the visit may not be the activities that the place supports, but the place itself. The person is thus attachment-oriented and will experience the sense of the place (Mitchell et al. 1993).

An environment is an inherent part of a person's worldview formed in the intentional structures of human activities (Karjalainen 1987, 1990b). Images play an important role in the interpretation of environmental perception and in the environmental experience. A person's inherent worldview, his previous experiences, attitudes and values also have an effect on his observation; this means the things that he sees or observes in his environment. People observe different objects in their environment, and the objects are filtered through a person's mind in the perception process (Downs & Stea 1973, Gould & White 1974, Gregory, ref. Vickers 1979, Schreyer et al. 1984). As Popper (1980) has pointed out, the "right" and unbiased observation of mind is an illusion. Anttila (1989) describes the perception process as an interaction process; an observer has his comprehension about reality. The observation and the comprehension interact with each other all the time.

When a person sees some scenery, or a picture taken from the scenery (Fig.1), he sees more than the scenery when the images combine with the visual observation (Downs & Stea 1973, Pocock 1973, ref. Hämäläinen 1974, Anttila 1989). The object that the person recognizes is thus a stimulus that

awakes the images. It has to be noticed, however, that a picture never portrays an object with or without all of its characteristics (Goodman 1993).

If the scenery has been described using words, the selection of the words as well as the meanings of the words play an important role in the experience that a person lives through after reading the description of the scenery. In this process, the problem of language and its connections with life styles is encountered - a question that has been thought about by Wittgenstein (ref. Aaltola 1985). Language is closely related to life style, ethnicity and culture; the language and the meanings of a single word have to be interpreted in the context of the word, as a reflection of ethnicity, culture and life style. As Saussure (1966, p. 223) says: "The social bond tends to create linguistic community and probably imposes certain traits on the common idiom; conversely, linguistic community is to some extent responsible for ethnic unity." Anttila (1989, p. 68, translated into English) describes the cultural relativity of a language in the following:

> We believe that we can think and speak freely. We do not notice that we have gradually been involved in the network of the language we use. We are not connected with the tradition in the use of the words and in the sentences we form but in our effort to become understood. The language carries very old pictures... Ancient pictures glide through us despite our will.

This thinking has perhaps to be emphasized in the case of old cultural concepts like *erämaa* (wilderness).

An important thing to remember is that although visual aspects are an important part of the perception of environment, odors, sounds, and also dermal touch are important aspects of overall experience as well (Karjalainen 1993). In the studies mentioned previously, only the visual dimensions have been taken into account. However, it would be valuable to consider environmental perceptions from a broader perspective.

Further, the physical environment cannot exist without social meanings that have been connected with it. As a meaning system environment reflects the attitudes and the values of the community (Kovalainen 1991). Thus it is obvious that we cannot perceive our environment without experiencing the *meanings* it holds. Moreover, the environment provides semiotic messages for us (see semiotic system and identity of region in Figure 1). As Tarasti (1981, 1990) has argued, the wilderness landscape can be seen through the semiotic pattern it represents (see also Karjalainen 1987). Since the national romantic time at the end of 19th century, the wilderness landscape has been seen as a "positive landscape outside the culture", thus the landscape has been defined. With the definition one can ask if the wildernesses, or the wilderness landscapes, are artifacts. Although the wilderness environment has not been made by human beings, wilderness is, however, a part of culture. It is "a living history" (Thompson 1987). According to the ideas of

Sepänmaa (1991), the decision to preserve the pristine nature of an area denotes that the area has been "thrown" inside the human culture and has been defined as a part of the culture. According to the ideas of Dickie (1971/1981) a nature area like a wilderness, is not an artifact in the meaning that humans have made it. It can, however, be an artifact in the sense that people have given it its special meaning. It has been defined within the cultural context. In this sense, a wilderness can be considered as an artifact as a whole, like a museum, and the objects like stones and dead trees (snags) can be considered as artifacts inside the museum.

There are perhaps some characteristics in nature that affect the wilderness character of a region, the character that can promote the wilderness experience. For example there can be some trees in a forest stand which are connected to a person's mental image of wilderness. Thus the stands with the trees exemplify wilderness (applying the ideas of Kalanti 1990). In the exemplification, a part of an object represents the whole object. If this is true, it is important to sustain these trees and these forest stands in a forest area when the forestry activities are done. It is important to understand the characteristics that exemplify wilderness and contribute to the wilderness experience (Merigliano 1990a).

Although the characteristics that can produce a wilderness experience can be defined, one may ask if it is possible to define how much these characteristics have to be present before an area can be considered as wilderness. If this is not possible, the wilderness concept remains vague. A possible approach is to consider the wilderness character of an area (and wilderness experience) as a continuum. It is the same with scenic beauty and the other qualities of an environment. According to this approach, one can only say that an area is more or less wilderness-like than another area (Nash 1982). This approach emphasizes that the term "wilderness" has to be considered as a predicate term following the philosophical ideas of Carnap (1948, Niiniluoto 1984). Thus the term is approached from its qualities. The 'intention' of the term describes the wilderness character characterized by the certain characteristics. The 'extension' of the term includes all the entities (the areas) that carry enough of these characteristics.

It is not, however, clear that it is possible to identify the characteristics of wilderness and if it is, what methods should be used to do this. One possible approach is to follow Hume's (1964) ideas about "the things that have been linked together" (called Hume's causality). According to Hume, at least the criteria of beauty are quite well established in a person's mind. To see an object is followed by an experience. Beauty denotes a secondary quality to Hume belonging more to a subject than an object. Thus, Hume represented subjectivism in the evaluation of the qualities of environment and did not share Beardsley's (1958) ideas of transcendental idea of beauty based on philosopher Plato's ideas. The transcendental idea means that beauty is a common feature in an environment shared by a beautiful object regardless of the existence of an observing subject. Based on Hume's thinking the

experiences that are produced by the characteristics of an environment can be expressed, and the expressions can be studied empirically (Kannisto 1977). However, according to Hume's theories, the ability to perceive the beauty is emphasized; an observer has to be on a certain cognitive level, unprejudiced and sensitive. Further, he has to have good taste and he has to recognize the right aesthetic characteristics (Goldman 1990).

There are, however, people who emphasize the difficulty to study these experiences empirically (for example Relph 1984, Paajanen 1994). Furthermore, one must consider if this kind of problem can be studied using a quantitative or qualitative approach, and which of the methods would be the best. Qualitative analysis may be better suited to solve the problem because the experience may be deep and fragile. Similarly, the deepness of the experience may be difficult to express using words or numbers. Quantitative methods have also had a role in studying scenic beauty and/or forest suitability for outdoor recreation, and the studies that have been made using these methods have given logical and repeatable results (for example Daniel & Schroeder 1979, Haider 1994, Hultman 1983a, Hultman 1983b, Kellomäki & Savolainen 1984, Pukkala et al. 1988). In many studies, the quantitative approach has been based on psychophysical theory. If, however, we emphasize a perceiver as a person and his background with the meanings attached to the landscape, we are using a cognitive approach (Zube et al. 1982).

2.3.2 The substance of wilderness experience

The wilderness experience can be an important dimension of the environmental experience that can be experienced in nature, via a slide or another picture describing landscape or by reading verbal descriptions about the landscape as well. An important question is, however, how wilderness experience can be characterized and classified. To find the right answer to this question it may be important to understand the motives of wilderness visits.

A problem emerges with the concept of *experience*. There are two kinds of experiences that are defined in many European languages: an everyday experience (*kokemus* in Finnish, *erfarenhet* in Swedish, called "experience" in this chapter) and a special experience (*elämys* in Finnish, *upplevelse* in Swedish, called "Experience" in this study). One may ask if wilderness experience is experience or Experience? Many European philosophers have defined the difference of these two concepts in their works. We can approach the question by defining the difference.

According to Kinnunen (1990) the difference between these two types of experiences is that Experience is experienced deeply and strongly but the experience is not. According to the ideas of a hermeneutic philosopher, Dilthey (ref. Kusch 1986) experiencing events in someone's everyday life (experience) can be considered as an unnoticeable flow in life (*erleben* in German language). On the other hand, Experience (*Erlebnis* in German language) can be considered as the interrelationship of meanings emerging

with retrospection. In Dilthey's philosophy, Experience is revealed as an expression discharging from someone's soul by reflection. Furthermore, Heidegger (1927) also makes the distinction between everyday experience *(er-leben)* and Experience. Macquarrie and Robinson (1980) use the German term *Erfahrung* in describing experience and the term *Erlebnis* describing Experience in their English translation of Heidegger's (1927) publication named *Sein und Zeit*. The same concepts are used by Schütz (ref. Hettlage & Lenz 1991).

Another hermeneutic philosopher, Husserl (ref. Kusch 1986) connects the concept of Experience with the concept of intention. According to Kusch (1986), Husserl determines the concept of "act" denoting the intentional Experience. In the simple "act" the consciousness is directed to a sensitive object. This makes possible the perception of so-called "based act". If we, for example, see trees in the row, we experience an avenue. In Husserl's philosophy this kind of perception is called "categorical perception". Husserl's ideas about the "acts" and the "categorical perception" arouse an interesting question: what kind of forest environment stimulates the categorical perception that will cause the Experience called the wilderness Experience? Although Husserl did not define the concept of Experience accurately, his ideas encourage the interpretation that all the mental states of which we are conscious may be called Experiences (see Kusch 1986).

Modern life has broken many of the previous connections between man and nature. The wilderness experience of hunter-gathering people, who represent pre-modern thinking, has been illustrated in the thoughts of aboriginal people (Brant 1982, Ovington & Fox 1982). In Finland, Saami people have retained their aboriginal life style for a long time. If a Saami person was asked where his or her home is situated, he or she would likely answer, as Valkeapää (1977) did, that it is not easy to say because the whole area is experienced as home by him. The transition from aboriginal to modern life style has been gradual. Most Finnish people, particularly those who live in the countryside, have retained a certain amount of aboriginal thinking inside them. Furthermore, from a cultural point of view, Finnish wilderness does not necessarily mean that the areas are experienced as being truly wild. Rather they have been experienced as "the storehouses of backyard". Although Finnish wilderness was not experienced in the past as a beautiful landscape (Linkola 1985), it was appreciated for its importance for survival, and thus experienced as an inevitable part of everyday life.

Although some pre-modern connections between man and wilderness can be found in the life style and experience spectrum of Finnish as well as the other Scandinavian people, the modern, and even post-modern, thinking is increasing its importance in these countries, too. The modern wilderness will perhaps be increasingly experienced as an opposite of everyday environment with its urban settings in these northern countries. Wilderness

experience of Scandinavian people will resemble more and more the wilderness experience of Anglo-American people (see Kolkka 1986, Oelschlager 1991, Tuan 1974) and the experience can be called Experience.

A substantial amount of previous research has been concentrated on the perceived *scenic beauty* of physical environment. Wilderness scenery has sometimes been regarded as beautiful scenery, for example in the works of Runeberg (ref. Topelius 1875/1981) wilderness has been described in a very affirmative way. In the description, the author praises the beauty of wilderness and mentions that there is nothing that can touch the mind of a hiker more deeply than the depth of the enormous vast, uninhabited forests. It is noticeable that the description has been written in the nineteenth century. In the original description, however, the word "wilderness" has not been used (Runeberg 1872), but Topelius (1875/1981) referred to those forests as wilderness in a headline of his publication named Maamme-kirja (The Book of Our Country, only in Finnish).

A question that has not been adequately studied is the relationship between the experience of scenic beauty and the wilderness experience. The experience of beauty has often been connected with the concept of *aesthetics*. The range of this concept is very difficult to define and, in many cases, the concept has not been defined exactly, merely it has been used as a synonym to beauty, or at least it has been connected to a kind of positive experience (for example Antikainen 1993). Furthermore, one may ask if the wilderness experience can be included in the aesthetic experience if the wilderness has not been experienced as a beautiful landscape.

Attempts have been made to empirically study the characteristics of aesthetic experiences, and to find out what the common characteristics defining this experience are (e.g. Brown 1983). Beardsley (1958, p. 527–530) presents some interesting characteristics that, according to him, characterize aesthetic experience (in these connections the experience should be written as Experience):

1. Aesthetic experience is an experience in which a person's attention has firmly been fixed upon heterogeneous but interrelated components of a phenomenally objective field – visual or audio patterns, or the characters and events in literature.
2. It is a rather concentrated and intensive experience.
3. It is an experience that hangs together, or is coherent, to an unusually high degree.
4. When the experience has temporarily been broken, it can be returned to afterwards.
5. The experience is unusually complete in itself.
6. It is an experience with an all-inclusive feeling of pleasure.
7. The experience does not cloud the senses like drugs do.

This kind of approach has been criticized. For example, according to Kinnunen (1990), an aesthetic experience depends on the cultural background of a person, and the experience is also deeply ideology-dependent. Thus, the common features of the experience may be hard to find. If, however, a certain commonness can be found, most of the features could also be interesting for wilderness experience.

Some authors emphasize that the validity of aesthetic evaluations are highly dependent on a person's ability to experience his or her environment and on his or her former experiences. Some people are used to observing the "right" things, can analyze them in the "right" way and are able to state the logical and wise arguments for their aesthetic evaluations (e.g. Goldman 1990). On the other hand, according to Croce (1972), it is impossible to separate 'subjective' from 'objective', and the image of feeling from that of thinking in the aesthetic analysis. Intuition plays the major role in the analysis.

Furthermore, knowledge has two forms: it is either intuitive knowledge or logical knowledge. The judgements of aesthetic values are altogether imaginary. We use both so-called aesthetic (e.g. beautiful, gaudy) and non-aesthetic (e.g. big, bent, barren) terms in our aesthetic evaluations and judgements. The first mentioned terms are based on the last mentioned. Examples and our former experiences are important in our judgements (see also Fig. 1). If the judgement has been made using the aesthetic terms, a person's ability to see the aesthetic things and express them is emphasized and may considerably affect the results of the judgement. On the other hand, if an aesthetic judgement has been made using a certain scale, one may conclude that the feeling, the strength of the aesthetic experience, has been expressed more spontaneously, and perhaps describes the first impression more reliably compared with the situation where a person has been forced to analyze the aesthetic and non-aesthetic things carefully and find the right words to describe the things and his or her feelings.

The concept of aesthetics has often been connected with the concept of art. The aesthetics of human works of art are judged. Sepänmaa (1986, 1991), however, proposes that an environment experience can be an aesthetic experience as well. According to Sepänmaa (1986, 1991) environment can be considered as an overall work of art. This idea is closely connected with the concept of 'total art' modified by the ecological thinking. The idea of 'total art' is based on Wagner's (1850) idea of *Gesamtkunstwerk* (total work of art in English). According to Sepänmaa (1991) the concept of beauty can be divided into aesthetic beauty, instructional beauty and moral beauty. Especially the last mentioned form of beauty might have interesting connections with the beauty of wilderness. One may think that if someone is experiencing wilderness as a beautiful landscape, it is affecting a person's moral, and also his or her cognitive consciousness of the importance of the wilderness conservation. These ideas are also connected with the concept of normative aesthetics used by Sepänmaa (1981).

Aldrich (ref. Anttila 1989) has argued that the same object can affect an aesthetic experience or an everyday experience. Thus the wilderness experience of a person who is working in a wilderness area can differ from the experience of a person who is spending his holiday in the area. The last mentioned person might consider the wilderness as a work of art devoting himself to the admiration of the area. The wilderness worker can experience the wilderness in a functional manner, as his or her everyday environment. Furthermore, Meeker (1974) accepts the idea that an environment may be considered as a work of art. An ecosystem is a process of art formed by natural forces without human touch. Beauty can be seen particularly in the self-adjustment of the process. To understand the process is the presupposition to understanding beauty. One difficult question, however, remains: Do we have the right to evaluate the beauty of nature (Wellek 1978)?

Although the wilderness experience may often be described as a *positive experience* including also the perception of beauty, negative and depressing feelings like the feeling of fear, have been connected with this experience as well (Kaplan & Talbot 1983, Short 1991, Greenway 1994). If negative feelings exist, can wilderness experiences be considered as an aesthetic experience? According to Vattimo (1989), an aesthetic experience can include the experience of alienation or homelessness. These experiences are, however, important for mental development. According to Kierkegaard (ref. Liehu 1990), the aesthetic experience is a very spontaneous experience.

As an example, Linne (1889/1969, p. 68) expresses his negative feelings towards wilderness during his visit in Lapland in the eighteenth century (translated into English):

> Now I was tired of this journey. This country of Lapps is nothing but mire. The right name for this country would be Styx (abode of the dead). A priest can never describe a hell that would be worse than this country. Further, the poems could never describe Styx as ugly as this country is.

Inadequate equipment and tiredness may have had an effect on the experience.

Further, vast forest areas has been feared, and on the other hand, admired according to the old European folklore and mythology. The forest is dark and mysterious environment with swarms of goblins, demons and spirits (Nash 1982). Particularly these myths live in the tales written by Beskow or Tolkien (Day 1980, Kardell 1991).

In his ethnological works, Castren (1872) considers the Utsjoki area in northern Lapland as a wilderness that is far away from the civilized world. According to him, the people of the area are untamed, and the fells of the area are disquieting. His writings, however, reveal that natural forces that are met during the visits on the fells in winter are the reason for the fear. Dark night in wilderness may also be a threat for the reason of wild beasts.

Short (1991) has mentioned three things that explain the feelings of fear that have been experienced in the wilderness:

1) The religions that substituted earth-centered animism; God rose into Heaven and left the Earth for evil spirits.
2) People had to fear those people living in the wilderness because the latter resembled wild beasts and lived outside of modern culture and its norms.
3) One has to fear the changes that wilderness causes in the mind of a human being. Wilderness symbolizes "id". The contact with wilderness resembles the contact with person's own sub-consciousness.

The large wild areas may also have been inhabited by fugitive criminals. (Kardell 1991).

In spite of the feelings of fear, the feelings of *shelter and safety* have been experienced during the visits in vast virgin forests as well (Järvinen 1964, Reunala 1987, Siltala 1987). Reunala's (1987) approach has been based on Jung's archetype concept. The archetype reflects the common ancient and unconscious experience of mankind, some kind of collective subconsciousness. Especially big trees and dead trees may be important sources of the strong archetype experience according to Jung's theory. A virgin forest may also symbolize a mother. According to Neumann (1974, ref Reunala 1987), contradictory, and even opposite, feelings like the feeling of safety and the feeling of fear are typical for mankind's archetype myths of maternity. The feelings of safety emerging beside the feelings of fear may be important feelings of some people's wilderness experience. They may feel like a little child in the arms of the enormous 'Mother Nature'.

Life in the wilderness may be hard and *ascetic*, but the experiences during life like this may be valuable. Thoreau (1854/1990) found the luxurious life as an obstacle to the spiritual development of mankind and chose a simple life in a forest for himself. The simple life style may enhance the feeling of freedom. This may be important for the hikers that nowadays visit in wilderness (see Fromm 1977, Hart 1984). The simple life is in contrast to the easy, modern life (Kolkka 1986, Kaplan & Kaplan 1989). Getches (1987) and Merigliano (1990a) emphasize the feelings of simplicity and originality. Furthermore, Getches (1987) also emphasizes the personal manner of the wilderness experience.

Self-respect, the respect towards nature, a personal relationship with nature, refreshment, learning new things, physical and psychological self-competence, friendship, freedom and solitude are the feelings that may be experienced in the wilderness (Brown 1983, Hendee et al. 1990, Merigliano 1990a). One dimension of the freedom is that a person is out of control during his or her wilderness visit. Thus the person can act freely and relax without the pressures that are laid upon him or her by the other people (Kaplan & Kaplan 1989). A wilderness visitor can "throw himself in the 'arms of nature' and fuse as one with nature. Furthermore, an important feeling dur-

ing a wilderness visit is the feeling that one has to earn something valuable; many valuable experiences are not possible without a certain amount of suffering (Hart 1984). Furthermore, Therman (1940/1990) describes wilderness experience with the feelings of purification and freedom.

To experience solitude during a wilderness visit does not mean that a person has to feel loneliness. The latter means that the person is forced to be alone. Nouwen (1986) uses the concepts of "open loneliness" (solitude) and "closed loneliness" (loneliness) to describe the difference between these two feelings (see also Hammitt 1994, Hollenhorst et al. 1994). Hollenhorst et al. (1994) suggest that the opposite of solitude is not crowding, but loneliness. Loneliness means "an incapacity or failure to utilize time alone for personal enhancement. The definition of solitude involves the state of mind as well as a state of being or place (Hollenhorst 1994, p. 235).

Some mystical and religious feelings have sometimes been connected with wilderness experience as well (see Kristiansson 1987, Hendee et al. 1990). Abrahamsson (1985) describes his wilderness experience on the Swedish fells with the feelings of beauty, freedom, safety, eternity and love. His experience resembles a religious experience. According to him, the experience always includes something irrational and hidden, and is thus impossible to measure. He mentions that a silent and peaceful environment is an important thing in waking up these feelings. The feelings of Abrahamsson (1985) have been shared by Kaila (1954, ref. Kinnunen 1990). Furthermore, Kaila mentions the feelings of solitude and wholeness as well as the feeling of acceptance in this context. Therman (1940/1990) describes wilderness as an area that has been touched by "the Great Spirit", where one can sense the deepest being of the Earth and the souls of the people that have been living in the area being a part of it. Furthermore, Muir (ref. Teale 1982) has described his feelings during a wilderness visit on the mountains in the United States as following:

> Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop off like autumn leaves.

Virkkula (1926/1991) agrees with most of the last mentioned feelings. One feature in his wilderness experience is, however, the tendency to *own the wilderness*. He describes his feelings in wilderness (translated into English)

> White wilderness - you vast backwoods of freedom, where a skier stands like a king in the middle of his kingdom, in the side of a mire...the ancient wild instincts awake there, and like an ancient inhabitant of the wilds he casts his gloomy glance at an old trail on the snow, the appearance of which is like an offence towards the impartiality of the empire, - your freedom fascinates, you white wilderness.

The same feelings appear from a wilderness experience of Järvinen (1996, edited by Uotila & Laine). Järvinen was rising up the river Tuntsa with the feelings that he describes (p.14, translated into English):

> Vast wilderness opened in front of us, and the inhabitation of Yläkurtti vanished from the view. We had a lot of foodstuffs for a long time, and all the relationships to the civilized world were cut off.

Furthermore, he continues to describe his wilderness experience (ibid. p. 14-15):

> We had no time to make any paintings, it was good to strive for up the river, feeling free, enjoying everything, water, wilderness, light, the joy of poling, to concentrate upon the life of streams and wilderness, completely without borders.

After that, Järvinen and his companion heard some news from the other visitors boating on the stream that there was an expedition coming up the river ahead of them. Then they were disappointed (ibid. p. 20):

> We were very disappointed when we noticed that there was a boat ahead of us. We had already allowed our souls to imagine that this time we could dominate the river all alone.

The feelings that have been experienced in order to describe the features of the wilderness experience may be *fragile and hard to arouse*. Keltikangas (1978), for example, wandered through the enormous forest and fell areas of Lapland measuring the forests as his job. However, he experienced the wilderness only once.

As it has been mentioned above, the transition from pre-modern society to modern society has perhaps changed the wilderness experience. These days, modern society may be changing towards the *postmodern* stage. One may ask about the effect of this transition on the wilderness experience. Oelschlager (1991) mentions the feeling of unity as a dimension of a postmodern wilderness experience. Furthermore, Van der Post (1980) approaches wilderness experience, at least partly, from the postmodern point of view being sorry about the difference that has grown between the inner, subjective world and outer, objective world. According to him, wilderness experience is important in order to increase understanding between the connections between different things. Furthermore, he finds a connection between the words "holiness" and "wholeness". On the other hand a postmodern experience may consist of many different elements (feelings). The experience may be fragmented in the way that the fragments build up a certain wholeness. The question about the reality of the experience itself does not play the major role in the postmodern experience (Urry 1990).

Lyytinen (1992) has studied the experience and feelings of wilderness visitors during their wilderness visit. The results reveal that the visit was experienced in all as a positive experience, especially mentally. Some hik-

ers experienced some negative feelings because of their physical condition. The feelings of self-competence, social togetherness and beauty and mightiness of nature were the positive feelings that were felt during the visit. Finally, it appeared that the feelings that were experienced during the wilderness visit varied at times. Positive feelings increased in abundance towards the evening and towards the end of the visit. Furthermore, positive feelings were experienced more often on every second day. The results of a study by Kaplan and Talbot (1983) reveal that positive feelings, like the feeling of exaltation, satisfaction and expanding the ability to observe new things, are experienced after the stress of readjusting to "normal" life is over.

In *conclusion*, it appears that the wilderness experience is a positive experience in general with the features of an aesthetic experience. Further, it may be strongly related to the culture and the background of a person. Perhaps a part of the experience can, however, be explained by the genetic background of a person. The wilderness character, which can be experienced in nature, exists as a continuum, with some identifiable nature characteristics that exemplify wilderness. The methods that have been used in aesthetic studies (studies of beauty) may contribute to the identification of these characteristics. In this work, the understanding of the wilderness experience will be based mainly on the cognitive approach rather than on the psychophysical approach.

2.3.3 The benefits of wilderness experience

The positive feelings that have been experienced during a wilderness visit can be regarded as the benefits of the experience. The benefits may be important for a wilderness visitor himself and for the society as well. The individual benefits of leisure activities have been studied rather carefully, but a lack of studies concerning social benefits is apparent (Driver & Brown 1983). Further, it is not clear which leisure benefits are appropriate for the benefits produced by the wilderness experience.

Brockmann et al. (1979) have found that nature experiences like wilderness experiences may expand a person's mental ability to take a different attitude toward different situations, help him or her to learn new skills, improve health and develop intellectual and cultural capability. Schreyer and Driver (1990) have also found numerous benefits produced by nature experience, e.g. increasing self-confidence and self-awareness, clearing of personal values, leadership, increasing aesthetic ability, ability to meet challenges, social skills, increasing cultural consciousness, better physical health, mental growth and decreasing stress. Although these benefits are produced by nature experience, it follows that the same benefits are achieved by wilderness experience as well. Learning new things during wilderness visits has been emphasized by Lyytinen (1992) as well. A person can develop a

new relationship with nature and other persons. Furthermore, he or she can learn to know him- or herself better, and learn a new attitude towards the meager material conditions that he or she will encounter in the wilderness.

Williams et al. (1989) refer to many of the above mentioned benefits. In addition they emphasize the role of wilderness as a fundamental symbol of national, biological and evolutionary heritage and personal identities that may be affirmed by the mere existence of wilderness. The consciousness of this existence has been found valuable for Americans in addition to the challenges that people have faced during their wilderness visits. They write (Williams et al. 1989, p. 169-170):

> Because the wilderness is a rich and potential source of personal, national/cultural and biological identity information, it plays a significant and valuable role in self-definition on all three levels of human functioning ... In terms of self definition, the wilderness acts as the physical object or environment that represents abstract human values, beliefs and characteristics.

The non-recreational values of wilderness in self-identity and self-definition are closely linked together with the mechanism of displays of signs and symbols. Beliefs and feelings about cultural identity are affirmed by the consciousness of the existence and preservation of wilderness. The role of wilderness in defining our biological identity is the role that wilderness plays in our beliefs about who we are as human beings.

Kuronen (1995, p. 27) deliberates upon the meaning of wilderness activities to a man in a way to find himself. His thinking runs as follows:

> A man goes into a forest to find himself. Perhaps all hunting, fishing and hiking work as a virtual reality that offers a safe and artificial world in a way to meet these threatening, forbidden and not allowed things that will call forth the real man from a man in the mythical level.

Kaplan and Talbot (1983) ask, what are the special mental benefits that will be received during wilderness visits, which differ from the benefits received during other leisure activities practiced in other kinds of environments? As an answer, they point out four useful feelings that can be experienced only in wilderness:

1) Wilderness is the only environment where a person can escape everyday pressures.
2) The things that are experienced in wilderness can really bring a person into an ecstatic mental state.
3) It is possible to build a mental map of a wilderness area, but it is difficult. Thus an imagination has an opportunity to operate.
4) A wilderness environment is very suitable for our natural activities. The activities that are important for survival in wilderness are in balance with our natural activities.

However, one should question, whether wilderness were the only place to experience these feelings. Merely, wilderness is a place where these feelings could easily be experienced.

The benefits that we get during our wilderness visits draw us into wilderness. We must, however, consider the factors that "push" us to the wilderness (Kolkka 1986, Aho 1994). In addition to the mental benefits, the social status that will be achieved by strenuous wilderness visits and cultural traditions are important attractive factors to entice people into wilderness. Social circumstances, such crowded conditions, difficult social conditions and personal leisure determinants are examples of the factors that "push" people into wilderness.

A wilderness experience has also been used consciously as a *therapeutic tool*, especially for disadvantaged people, but for "ordinary" people as well. Even though the experience may include the feeling of fear, it may also be a source of healing and personal growth, self-confidence and self-esteem. Furthermore, a person has an opportunity to find his or her own position in the human relationship and personal relationship with nature. The therapeutic value of wilderness experience, and nature experience in general, has been studied using psychological and medical methods contributing to the previously described findings (e.g. Greenway 1994, Hammitt 1994, Hartig et al. 1994, and Pitstick et al. 1994). It has to be mentioned, however, that we are in the beginning in the research of wilderness therapy (Scherl 1989). The approaches and the results of the study have also been criticized (e.g. Levitt 1982, Greenway 1994).

2.3.4 What are the environmental characteristics promoting wilderness experience?

Previous discussion about the concept of wilderness revealed some nature characteristics that may promote wilderness experience, e.g. the wilderness has to be vast, natural looking with virgin forests, inhabited by wild animals and it has to be roadless (see Everett 1978). These characteristics may be a part of a person's mental images of wilderness, but it has not been affirmed earlier by any empirical research in Finland. Furthermore, there may be some characteristics that have not been found to be important for the experience. In the United States, Merigliano (1990a) has drawn up a list of the indicators that could be measured to reveal how well an area is suited for producing wilderness experiences.

Nature has always consisted of a biological mosaic structure. First, there is the mosaic consisting of different ecosystems like lakes, mires, forests, fells, streams and brooks. Second, the same ecosystems consist of a mosaic; for example a forest area can be divided into forest stands. Thus the characteristics that promote wilderness experience have area-based and stand-based dimensions; it is important to define the wilderness character of an area, but

every (forest) stand in the area has its own wilderness character. The variation of the character is an interesting and important tool for the manager of the area as well.

In this study, the wilderness character of a forest stand will be emphasized while trying to find out the characteristics that promote or prevent wilderness experience. The characteristics are studied qualitatively (e.g. there are snags that promote wilderness experience) and quantitatively (e.g. the certain number of snags with the certain total volume of the stock of trees and the certain diameter of the median tree produces the wilderness experience of certain degree). The quantitative approach makes it possible to build mathematical models for computer programs to be used as tools by managers. Before the model can be considered to be reliable, the variations in the evaluations of the wilderness character of the forest stands have to be small enough. Furthermore, it would be useful to understand the reasons behind the variation (e.g. to find out the rules for the variation between different groups of people with different sex, age, occupation, education, social status and so on).

3 The aims of the empirical study

The general aim of the study is to find out what are the forest characteristics that promote wilderness experience in forests, and what are the areas where wilderness character is important to Finnish people. If these characteristics are important and they can be identified, then the question to be answered is: *what kinds of forestry practices are suitable in areas where retaining wilderness character is important*? Besides these dominating aims, it is important to:

- find out what mental images Finnish people have about wilderness and the variations in these images;
- find out what kinds of forest environments affect the wilderness experience of Finnish people;
- find out whether the forest characteristics that improve the wilderness character are the same as the characteristics that improve the scenic beauty or the forest's suitability for outdoor recreation;
- find out if it is possible to use slides instead of nature visits in the study of the wilderness character of a forest stand as well as the other scenic properties of the stand;
- find out where areas with high wilderness character are in Finland.
- study the Finnish people's recreational use of wilderness as well as non-wilderness (so-called 'ordinary' nature) areas and the motivations behind the recreational activities;
- study the attitudes of Finnish people towards the wilderness areas.

4 Materials and methods

4.1 The data sets

Three different data sets were used in the empirical study. *Data Set 1* was a postal questionnaire sent to 2 000 randomly chosen Finnish people (age 18 years or more) in 1990. The sample was detremined randomly by the Statistical Center of Finland (Tilastokeskus in Finnish). Despite the age limit, some younger respondents were accepted in the sample if they had filled in the form. However, the number of these young respondents is very few compared with the total size of the sample. Furthermore, the sample group was first divided into four regions: southern, western, eastern and northern Finland, and 500 questionnaires were sent to all the regions. The administrative districts of the four regions (in 1990) were the following: southern Finland (Uusimaa, Häme, Middle-Finland), western Finland (Turku and Pori, Vaasa), eastern Finland (Kymi, Mikkeli, Kuopio, North-Karelia), north Finland (Oulu, Lapland).

Thus the sample was a disproportionate random sample (Jyrinki 1976). From those 2 000 people, 44 % returned the questionnaire. By region the percents are: southern 46 %, western 37 %, eastern 47 %, and northern 46 %. A random sample of 30 people from those people who did not respond were interviewed by telephone and asked why they did not respond, whether they think there are wilderness areas in Finland and what their opinion is about wilderness preservation and wilderness management. They could also express their arguments for the last question. The data of the postal questionnaire was computed only using frequency tables. The questions of the postal questionnaire are found in Appendix 1.

Data Set 2 consisted of two questionnaires directed to 359 Finnish people. The people were met in 15 organized meetings. Those people were asked to participate in events. The selection criteria of the people were the following: 1) groups of students in some colleges were asked to participate by their teachers; 2) some "key people" working in certain organizations were asked to collect a group of volunteers among their customers; 3) visitors in certain holiday centers were asked to participate in the meeting. The requests were distributed via announcements and by asking encountered people to participate. The respondents of Data Set 2 were asked to evaluate certain scenic characteristics from slides of 54 forest stands. After that they were asked to respond to a questionnaire about themselves and express their attitudes towards nature and wilderness as well as their recreational use of these environments. Similar to Data Set 1, these questionnaires were analyzed using quantitative methods. The questions of these questionnaires are found in Appendix 2. The groups of the respondents of Data Set 2 were:

- Students of Rovala College, Rovaniemi (n=38)
- Visitors in Saariselkä Holiday Centre, Inari (two samples, total n=54)
- The Center for Adult Education, Rovaniemi (n=57)
- Staff of the Forest Research Institute, Rovaniemi (n=16)
- Guests in Kairosmaja Holiday Centre, Pelkosenniemi (two samples, total n=61)
- Guests of the Hotel Kultakero, Pyhätunturi, Pelkosenniemi (n=11)
- Visitors in Pahtaja Holiday Village, Rovaniemi (two samples, total n=21)
- Students of Kuru Forestry College (visiting Rovaniemi, n=35)
- A group of people in Iisalmi (n=28)
- A group of people in Juuka (n=7)
- A group of people in Masku (n=11)
- A group of people in Alastaro (n=20)

The groups of people and the places of the sessions were chosen in order to get as representative a sample as possible compared with the Finnish population, keeping in mind the available resources.

In these sessions, pictures that had been taken using normal and wide-angle lenses were shown simultaneously side by side. If the impression of the scenic characteristics was felt to be the same by a respondent in both pictures, the respondent was asked to put one number on the paper. If the impressions differed from each other, the respondents could express his or her opinion using two numbers. The evaluated scenic characteristics were the scenic beauty and the wilderness character of the forest stands as well as the forest's suitability for outdoor recreation. The evaluation scale ranged from 0 to 10 (0 means that a forest does not include scenic character at all and 10 means that a forest includes scenic character very much).

The works of some Finnish, Swedish and Anglo-American authors of *narrative literature* representing different periods were analyzed qualitatively and partly quantitatively (the frequency distributions of the expressions of certain Finnish authors). The selected authors were known to be interested in wilderness or wilderness recreation. Two things were observed in the text: 1) how an author defines wilderness, and 2) how an author describes wilderness experience. All the works of the authors were not available, but the works that have been used in this study were thought to be enough to reveal the mental images of the authors about wilderness and wilderness experience.

The expressions, as well as all the Finnish citings in this work, have been translated into English by the author of this work. Especially some expressions using old or dialectal words were difficult to translate. Thus, the correspondence of the words may not be perfect. To help the interpretation of the words, the original Finnish words have often been mentioned in parentheses or italics.

The biological characteristics of the 54 forest stands were measured as independent variables to explain the variations in the scenic evaluations in Data Set 2. The forest stands consisted of 51 stands that had been selected from stands near Rovaniemi in southern Lapland, and 3 stands were located near Inari, northern Lapland.

A data set was collected by showing 51 forest stands located near Rovaniemi to 30 students of Rovaniemi Forest College asking them to evaluate the scenic features using a scale from 0 to 10. The evaluations were done in nature. A year after these evaluations these same students were asked to evaluate the same forest stands via slides. The lag time was used so the students would not obviously remember the stands and their scores for the stands, particularly when the stands followed each other in random order (see Mueller 1986). There were two sets of slides: those stands that had been taken using a wide angle lens (focal length 45 mm in 6 cm x 4.5 cm format camera) and those that had been taken using a normal lens (focal length 80 mm in the same picture format). The two lenses were used to test the best fit between the scenic estimations via slides and the scenic estimations which were made in nature. In both sets of slides, the stands followed each other randomly.

The distributions and the other features of the variables describing forest stand characteristics as well as the characteristics of the respondents of Data Set 1 and Data Set 2 are characterized in Chapter Five.

4.2 The selection, photography and measurements of the forest stands

The 51 forest stands near Rovaniemi were chosen so that they would represent different kinds of forest stands which are encountered in the Perä-Pohjola district. The forest stands near Inari represented the suggested wilderness cuttings made by the National Board of Forestry (see Erämaakomitean mietintö 1988) and they were evaluated only via slides.

To find out the effects of different forest characteristics on the scenic experiences, there had to be stands with different compositions of tree species, stands of different ages of trees, volume of stock, diameter and height of trees and so on. There also had to be stands that have been managed using different silvicultural practices: thinned stands, seed-tree areas, ploughed areas, drained mires as well as stands in their natural condition (e.g. virgin forests and unaltered mires). Furthermore, there had to be a road connection to the stands, and the stands had to be quite near each other because the evaluations were made in nature. The terrain of the stands had to be flat and uniform, and no water was allowed in the scenery of the stand, because the aim was to determine the forest characteristics that affect the values of scenic estimations.

In a forest stand, the observation point was established first and then the direction of glance was determined. Two slides were taken in the direction of glance from this observation point. The slides were taken in summer 1991. They were taken in the daytime and the weather conditions had to be cloudy or sunny with haze to get as uniform results as possible. The direction of glance was told to the evaluation group (the students) who visited the forest stands.

The forest characteristics of the stands were measured. Two kinds of sample plots were used in this work. The trees with a diameter at breast height of 7 cm or more were picked out using a relascope. Smaller trees were measured using sample plots with a radius of 1.98 meters. Four to ten plots of both types of sample plots were measured in each stand depending on the visibility in the forest.

The measured characteristics using the *relascope plots* were: the diameter, the length and the age of trees, the number of stems and the basal area of stems with a diameter at breast height of 7 cm or more. The measurements were made for deciduous trees, for Scots pine and for Norway spruce separately. Standing dead trees of all the species were measured as a group. The characteristics, such as the volume of the tree stock and the volume of a single stem, were computed using a computer program named Mitta, developed by Pukkala and Parikka (1987). Diameter, age and length were measured for the median and maximum trees of the deciduous trees (as a group), pine, spruce and standing dead trees with a diameter at breast height of 7 cm or more. If the height of a tree was more than 1.3 m, the diameter was measured at breast height. When the trees were shorter, the diameter was measured at the base of the tree.

The characteristics that were measured in *circle plots* were: the number of stems, the height of the median tree and its base diameter. The age of the median tree was measured if there were no trees that were big enough for relascope plots in the stand. Standing dead trees were not measured in these plots. Living Scots pines, Norway spruces and deciduous trees as a group were measured separately. Furthermore, the coverage of willow and juniper bushes, the coverage of bare stones, the coverage of slash and the amount of epiphytic lichens on the branches were estimated in these plots as well.

The number of *stumps* was measured using the circle plots. *Laying dead trees* with a diameter of 7 cm or more at the base were counted using circle plots. A median lying dead tree was determined, and its diameter and length measured. The tree species were treated as a group. If there were few dead trees lying on the ground, a little epiphytic lichen, bare stones, stumps or bushes in a stand, overall estimations were made in the forest stand. Epiphytic lichens were estimated using the classification of the 8th National Inventory of Finnish Forests (Metsäntutkimuslaitos 1986) with a modification: class 4 denoted that the epiphytic lichens are abundant, but the indi-

viduals are small, and class 5 denoted that the lichens are abundant and the individuals are rather big (most of them are over 5 cm long).

4.3 The statistical analysis

In both questionnaire data sets (1 and 2), the open-ended questions, except the names of wilderness areas, were classified for the analysis. The region (southern, northern, western and eastern Finland), the county, the administrative district and the municipality of the wilderness areas mentioned by respondents were determined. Counties (provinces) of the areas were classified using a division used by Paasi (1986).

4.3.1 Data Set 1

Data Set 1 was mainly analyzed using frequency tables to see the distributions of the variables. Cross-tabulations with Pearson's chi-square (and log-likelihood) tests were used to reveal interdependencies between the variables mainly describing the background of the respondents. In certain computations, Mantel-Haenzel's test of linear association (sometimes called linear-by-linear association) as well as Cochran's test of linear trend were used to identify the trend between row and column variables (SPSS Inc. 1997, Wilkinsson & Engelman 1996). The uncertainty coefficient (uc) is used in the cross-tabulations to reveal the proportion of the variation in the column variable that is explained by the variation in the row variable. The coefficient reveals if the variation in column variable explained by the variation in row variable is significant despite the fact that the proportion of the explained variation may be rather low (Agresti 1990, Mehta & Patel 1995). The validity and the power of the tests in the cross-tabulations were increased using an exact Monte-Carlo estimation of the p-values of the tests. This estimation is important particularly when Pearson's (as well as log-likelihood) chi-squared test is used in the situation of low expected frequencies (Mehta & Patel 1995).

In addition to the cross-tabulations, logistic regression models were used to find the best independent variables describing the background of the respondents to explain (or predict) some of respondent's attitudes or other selections (their outdoor recreation habits and so on). The advantages of these models are the opportunity to study the effects of several independent variables at the same time as well as the effects of the possible interactions of the independent variables. Furthermore, the odds ratios are important in describing the differences between the groups of the respondents as well. The stepwise analysis based on the likelihood ratio statistics was used to help the selection of the independent variables in the computations of the logistic regression models.

The classified background variables that have been used as independent variables in most of the computations were the following (used classes in the parenthesis):

Sex	(male, female)
Age (years)	(40 or younger, 41-59 years, 60 or older)
Education	(primary school or less, junior high school, high school graduate)
Environment of residence (during childhood)	(city, village, countryside)
Geographical region of residence (during childhood)	(northern Finland, western Finland, eastern Finland, southern Finland)
Administrative county of residence (during childhood)	(the administrative districts of Finland during 1990)
Socioeconomic status (Tilastokeskus 1983)	(higher white-collar employees (higher white-collar), lower white-collar employees (lower white-collar), blue-collar employees (blue-collar), farmer, entrepreneur, student, home-maker)
Occupation (Tilastokeskus 1987)	(scientific/technical, social/health care, administrative/office, commercial, agriculture/forestry, industry, service)

In the definitional perception questions (see Heberlein 1982, Hummel 1982) and in the question about the reasons for wilderness preservation or protection used in both questionnaires, the differences in the verbal descriptions of the wilderness, as well as the reasons for wilderness preservation or conservation produced by the groups of the respondents, were examined using chi-square test (differences in the frequencies) and Spearman's rank order correlation coefficient or Kendall's coefficient of concordance (differences in the order of the expressions).

The differences between the groups of the respondents in the contingent valuation question, and the question where respondents estimated their annual travels (in kilometers) during their wilderness visits were tested using Mann-Whitney's U-test and Kruskal-Wallis' one way analysis of variance. These non-parametric tests were used because of the skewed distributions of the variables.

The estimations of the verbally described forest stands have been done using a five-point Likert-scale. The interdependency (correlation) structure of the forest stands was studied using an exploratory principal component analysis based on Spearman's rank order correlation matrix. Furthermore, the internal consistency of the principal components (groups of the forest stands) was studied using the reliability coefficient of Cronbach's alpha (Mueller 1986, de Vellis 1991, Norušis/SPSS Inc. 1997).

Moreover, the polychoric correlations (Jöreskog & Sörbom 1988) were computed between the estimations of the wilderness character of the verbally described forest stands and the ordinal scale variables that describe the respondents' backgrounds. Spearman's rank order correlation coefficient was also used in the examinations of the interdependencies between the ordinal scale variables. The correlation structures have been compared with each other. Iterative polychoric correlation is perhaps more suitable for the categorical variables with very skewed distributions and different amplitude ordinal scales, especially if the correlation matrixes are used for the confirmatory factor analysis (LISREL-models, see Leskinen 1987, Bollen 1989, Jöreskog & Sörbom 1989). However, in an exploratory analysis like this, the advantages of the latter mentioned correlation analysis may not be very big.

Furthermore, the correlation matrix of the wilderness character of the verbally described forest stands with the ordinal variables describing a respondent's background was analyzed using multi dimensional scaling (MDS). MDS procedure treats the data as ordinal using Kruskal's least squares monotonic transformation and the Euclidean distance model (Norušis 1992). In addition, the grouping of the forest stands were analyzed using the principal component analysis.

An aim of this study is to determine the wilderness attraction of different parts of Finland. For determining the wilderness attraction index of the administrative districts of Finland, the following formula was developed:

$$EI = \frac{\sum_{i=1}^{n} l_i * f_i}{L_k},$$

Where

EI = Wilderness attraction of the administrative district

L_k = The area of an administrative district in square kilometers.

l_i = The distance index between a visitor's home district and the district where a wilderness area is situated (a relative distance, when the distance between the districts of Uusimaa and Lapland is 100 measured from the midpoints of the districts).

f_i = The number of visits in an administrative district where a wilderness area is situated.

The wilderness attraction indexes of the administrative districts were compared with some ecological features of these districts (sources: Kuusela & Salminen 1979, Metsätilastollinen vuosikirja 1990–91) using scatter plots and regression analysis (the regression analysis with cautions).

The respondents' activities and motives in their wilderness recreation were studied using three-way cross-tabulations. Furthermore, the effects of the respondents' background on the selection of their primary motives and activities were tested using cross-tabulations with additional tests. Logit-models were used to find the best variables to explain (or predict) the selection of the primary motives and the activities. The most important activities and motives were also studied multiplying the frequencies of the primary activity and motive using a coefficient of 3, secondary activity and motive using a coefficient of 2 and third-order ones using a coefficient of 1. After that the scores were summed. The high values of the summed scores revealed the most important activities and motives. The interdependencies between activities and motives were studied using cross-tabulation. Finally, the results and some background data of the sample of non-respondents were compared with the results of the postal questionnaire.

4.3.2 Data Set 2

The best correspondence between the scenic evaluations in nature and the scenic evaluations on the slides that were taken with the two lenses and evaluated by the 30 forest college students were tested stand by stand using Spearman's rank order correlation coefficient and Cronbach's alpha as a measurement of the reliability of the re-evaluations (Mueller 1986, Norušis/ SPSS Inc. 1997). The re-evaluations cannot be assumed to be completely independent despite the lag-time. Furthermore, a sign test that reveals the differences in the medians of the evaluations was used. The aim of this work was to reveal which of the two lenses provides the closest result compared to the evaluations in nature for each forest stand. The scenic evaluation scores of the slides that were taken using the lens of best correspondence was used stand by stand as the final results of the scenic evaluations of Data Set 2.

Cronbach's alpha for each of the stands was computed between the slide evaluations and the evaluations that have been made in nature for the normal and wide-angle lenses. After that, Spearman's rank order correlation coefficient was used to determine the forest characteristics that make it difficult to evaluate the amenity values (scenic beauty, the wilderness character of the forest stand as well as a forest's suitability for outdoor recreation) both in nature and on the slides. Furthermore, a nonlinear regression model was used to establish the interdependency between the scores of the slide evaluation of the forest stands and the differences in the evaluations in nature and on the slides.

As a result of the scenic evaluations in Data Set 2, the median scores of the scenic evaluations were computed for each stand using the evaluations of all the respondents of Data Set 2. Before that, the best lens had been chosen for each stand, and the scores for the three amenity values that had been taken using that lens were used in the computations of the median

values. Furthermore, the median values for the groups of the respondents of that data set were computed to compare the groups to each other. The groups of the respondents were based on age, education, occupation, residence and so on. The differences in the evaluations between the median scores of different groups were tested using Mann-Whitney's U-test, Kruskal-Wallis one-way analysis of variance and parametric one-way analysis of variance. The results of the latter mentioned analysis were reported if the variances of the groups were equal. This was computed using Levene's test of the homogeneity of variances.

Spearman's rank order correlation coefficients between the biological forest characteristics and the scenic evaluations were computed. After that, Varimax-rotated principal component analysis was computed using this correlation matrix as the input data. In the first computation, the biological and scenic characteristics were in the same matrix. Thus dependent and independent variables were not separated from each other. After that, the analysis was computed using only the correlation coefficient between the biological characteristics. In this computation, the principal component scores were computed besides the component loadings. Furthermore, Spearman's rank order correlation coefficients between the scenic estimations and the principal component scores were calculated to compare the results in the situation where the scores of the scenic evaluations have been interpreted purely as the dependent variables. In both principal component computations, the principal components with an eigenvalue of more than one were included in the analysis.

Spearman's rank order correlation was used because of the skewed distributions of the variables, and because the scenic estimation scores were interpreted as the measurements using the ordinal scale. The biological (forest characteristics) variables used in these computations were selected in the analysis based on their correlations with the scenic characteristic variables (as high as possible) and the correlations between these biological variables (as low correlations as possible).

Discriminant analysis was used to find the few best variables to predict the scenic characteristics, and to find the classification rules to classify forest stands into the following classes: scenic quality under the median of all the stands, quality equal to the median of all the stands, and quality over the median of all the stands. This kind of classification is also convenient for the practical purpose to classify the forest stands of a forest area. Discriminant functions were computed for scenic beauty, wilderness character and a forest's suitability for outdoor recreation. The selection of the variables for the discriminant analysis was based on: 1) a strong correlation between the biological characteristics variables and the scenic characteristics variables, 2) minimal correlation between the independent variables, and 3) rather normal distribution of independent variables because of the parametric analy-

sis. The final selection of the variables for the discriminant model was done using stepwise discriminant analysis.

The questions in the questionnaire revealing the respondents' attitudes, backgrounds and so on, were treated in the very same way as the questions in the postal questionnaire (Data Set 1). Thus the main methods were frequency tables and cross- tabulations with chi-square tests. The latter mentioned method was used mainly in studying the interactions of the respondents' opinions and attitudes by their personal properties and background. The results of some questions to reveal the respondents' outdoor habits (how many times per week they usually visit nature and so on) were not computed by the groups of respondents because these questions are not very important for the aims of this study. The definitional perception question as well as the question about the respondents' attitudes towards wilderness preservation were treated using the same methods as were used in the computations of Data Set 1.

A question in Data Set 2, where the respondents were asked to assign a score using a five-point Likert-scale to the verbally described objects and situations that they might encounter during a hypothetical wilderness visit, was analyzed using multi-dimensional scaling (MDS) with Kruskal's least square's monotonic transformation and the Euclidean distance model (the default in SPSS statistical package, see Norušis/SPSS Inc. 1997). The differences in the Likert scale scores were treated as dissimilarities. In the scale, number 1 means that an object, or a situation, disturbs very much the wilderness experience and number 5 that an object, or a situation, enhances the experience.

The questions where the respondents were asked to evaluate the appropriateness of some constructions in a wilderness context were in part the same in both data sets. The two data sets had, however, different response categories. In Data Set 1, respondents were asked whether some constructions are appropriate for wilderness or whether they are not while in Data Set 2 the appropriateness of constructions and management practices were ranked using the five-point Likert-scale ranging from 1 (not appropriate at all) to 5 (very appropriate). This question in Data Set 2 was analyzed using a cluster analysis with Ward's clustering algorithm (Norušis 1992). Although the scale used should be interpreted as an ordinal scale, the mean values of the evaluations were also calculated to make it easier to interpret the dendrogram.

4.3.3 The interdependencies between the variables describing the respondents' personal properties and backgrounds in both data sets

The frequency distributions of the questions revealing the respondents' backgrounds were calculated and the results were compared with the distributions of the same properties among the Finnish population (Suomen

työvoimatutkimus 1990, ref. Siitonen H. 1993, personal comment, Tilastokeskus 1991a, 1991b).

To characterize the respondents, the interdependencies of these variables were studied using cross-tabulations with chi-square tests. The interdependencies of six background variables were studied using hierarchical log-linear models as well. Three variables were taken into a model at a time. The cell frequencies would be too sparse with more variables. In the saturated models, a three-way interaction term was included in the model. In the case of sparse frequencies, this term is, however, the most suspicious (unreliable) term when it was tested based on the chi-square distribution (see Upton 1980, Agresti 1990).

5. The forest stands and the respondents

5.1 The forest stands

The sample of the 54 forest stands is not a random sample. However, the stands represent the whole scale of the economically usable forests that are found in Finland, and particularly in the Perä-Pohjola district. Thirty-one stands are dominated by Scotch pine when the dominance is measured by the volume of tree stems (trunks). Eleven mineral soil stands are dominated by Norway spruce and eight stands by deciduous trees, mainly by birches (*Betula pubescens*, Ehrh. with some *Betula pendula,* Roth). Four stands are completely treeless clear-cuts. There are nine mire stands, two of which are completely treeless. Six mire stands have been ditched. In one ditched stand, there are rather new ditches that are clearly seen in the scenery. Some main characteristics of the forest stands are illustrated by stand in Appendix 3.

The *density* of standing trees varies from a treeless stand to 7 693 stems/ha with the mean of 2 002 and the median of 1 622. If the stems with a diameter at breast height of at least seven centimeters are counted, the maximum number of stems is 2 893 stems/ha. The mean value of all the stands is 812 stems/ha and the median 807 stems/ha. The deciduous dominated forest stands are the densest (Fig. 2). The number of stems is closely connected with the visibility in the stand. The *visibility* varies from 12 meters to over 100 meters. The visibility is 100 meters or more on nearly half of the stands. The mean of the visibility is 64 m.

The maximum *diameter* of pines at breast height ($d_{1.3}$) is 55 cm, spruces 56 cm and deciduous trees 52 cm, and the corresponding *heights* are 23 m, 23 m and 20 m respectively. In general, spruce and pine-dominated stands include thicker trees than the deciduous dominated stands (Fig. 2). The maximum diameter of standing dead trees is 48 cm and the maximum height is 21 m. The maximum diameter of fallen dead trees measured at 1.3 m from the base of the stem is 27 cm.

The maximum diameter ($d_{1.3}$) of *median* trees defined on the stands are: pines 37 cm, spruces 31 cm, deciduous trees 35 cm and standing dead trees 41 cm. The corresponding heights are: pines 18 m, spruces 20 m, deciduous trees 17 m and standing dead trees 17 m. The average diameters and heights that have been calculated based on all the stands are considerably lower than these maximum values (Table 1).

The density, diameter and height of the trees affect the *volume of the tree stock* of the forest stand. The *total volume* of all the tree stems varies from treeless to 279 m^3/ha. In general, the spruce-dominated stands have more tree mass expressed by the volume of tree stock compared with the stands dominated by pines or deciduous trees. The maximum volume of tree stock is, however, found in a deciduous-dominated forest stand (Fig. 2). The average volume of tree stock that has been calculated based on all the stands is 83 m^3/ha expressed as mean value and 67 m^3/ha as median value.

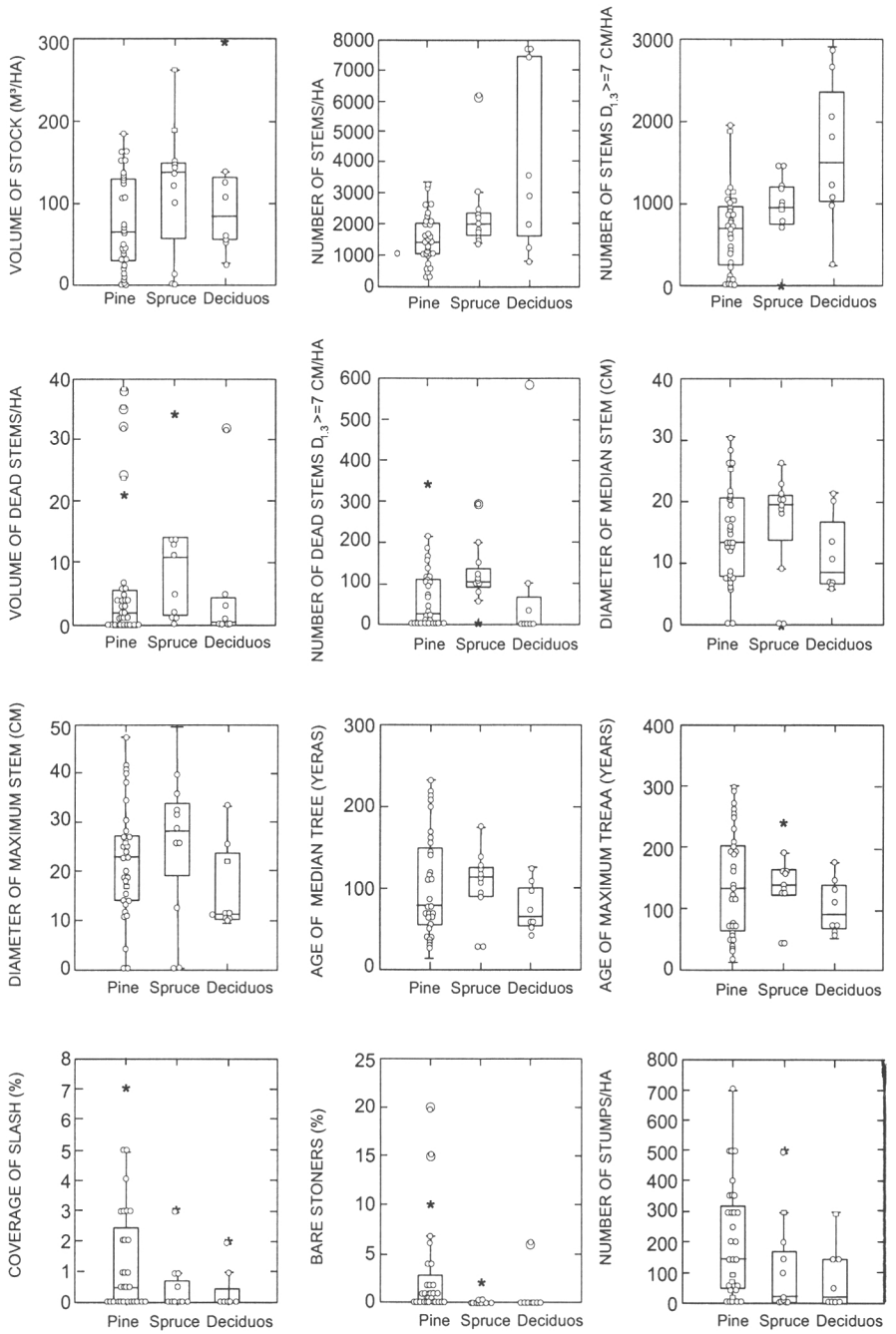


Fig. 2. The distribution of some forest characteristics of the forest stands dominated by Scots pine, Norway spruce and deciduous trees. Horizontal lines in the boxes denote median values. Extreme values have been marked with asterisks and outliers with bigger circles. Smaller circles represent individual forest stands.

Table 1. The mean, standard error of mean (SEM) and median values of diameters and heights of the trees on the forest stands.

Dimension	Mean	SEM	Median
Maximum diameter of living tree (cm)	29.3	2.1	33.5
Median diameter of living tree (cm)	15.7	1.2	16.5
Maximum diameter of standing dead tree (cm)	14.1	2.0	13.5
Median diameter of standing dead tree (cm)	11.3	1.5	11.3
Maximum height of living tree (m)	13.8	0.9	16.0
Median height of living tree (m)	10.1	0.7	11.6
Maximum height of standing dead tree (m)	6.1	0.9	4.5
Median height of standing dead tree (m)	4.9	0.7	3.7

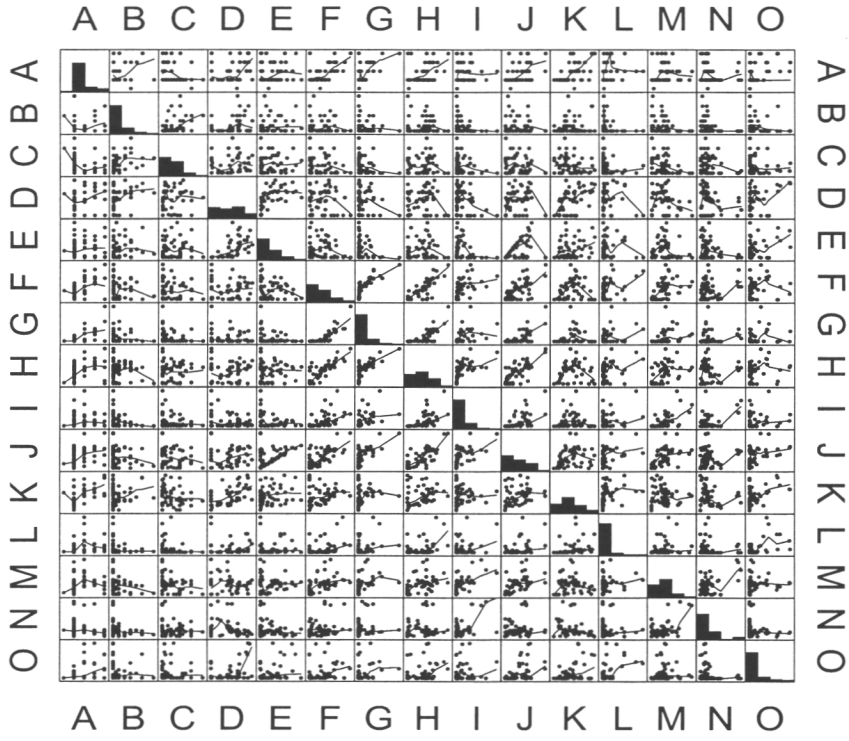
The maximum volume of the *standing dead stems* is 20 m^3/ha, *fallen dead stems* 32 m^3/ha and the *total volume of dead stems* is 38 m^3/ha. The average volume of dead tree stock on the stands is, however, remarkably lower compared with the maximum volumes found in some stands. The means are in corresponding order: 2.2 m^3/ha, 4.7 m^3/ha and 6.9 m^3/ha and the medians are 0.4 m^3/ha, 0.6 m^3/ha and 2.0 m^3/ha respectively.

The maximum *age* of the trees on the forest stands is 302 years. The tree of this age is found in a pine-dominated stand. The mean value of the oldest trees in the stands is 125 years and the median value is 124 years. The maximum age of the median trees is 232 years. The mean of the average ages of all the stands is 92 years and median 84 years. In general, the average age of pine and spruce dominated stands is rather equal, but the variation in age among the pine-dominated stands is bigger than it is among the spruce dominated stands. The stands dominated by deciduous trees are the youngest (Fig. 2.).The maximum coverage of *bare stones* is 20 % of the ground. It is found in a pine-dominated stand. However, there are not very many bare stones in the stands, the mean coverage of all the stands is only 1.9 % and the median coverage is 0 %. The pine-dominated stands are more stony than the spruce or deciduous dominated stands. The situation is rather similar to the coverage of *slash* and the number of *stumps*. The maximum coverage of slash (7 %) is found in a pine-dominated stand, the mean coverage of all the stands being 1% and the median coverage 0 %. The maximum number of stumps is 700 stumps/ha with the mean value of 165 and the median value of 125 (Fig. 2). The minimum value of all these variables in the data set is 0. Epiphytic lichens are abundant on the trees of the most forest stands, but the lichens are sparse and the individuals are rather little in most of the cases (Table 2).

Table 2. The abundance of epiphytic lichens in the forest stands.

Abundance of lichens	No lichens	Sparse	Moderate	Abundant	Very abundant,big ones
% of the stands	1.8	57.4	18.5	13.0	9.3

The distributions of some forest characteristics that are used as independent variables in some further analysis are highly skewed. Furthermore, the interrelationships between some variables are not linear (Fig. 3). The comparisons between the age and tree species dominance distributions in the



The symbols:

A Epiphytic lichens (classified)
B Coverage of slash (% of the ground)
C Number of stumps/hectar
D Diameter of maximum pine stem (cm)
E Total volume of pine stems (m^3/ha
F Diameter of maximum spruce stem (cm)
G Total volume of spruce stems (m^3/ha)
H Diameter of maximum deciduous stem (cm)
I Total volume of deciduous stems (m^3/ha)
J Total volume of living tree stems (m^3/ha)
K Age of median living tree (years)
L Total volume of standing dead tree stems (m^3/ha)
M Number of tree stems ($d_{1.3}$ >= cm)/ha
N Number of tree stems ($d_{1.3}$ < 7 cm)/ha
O Total volume of fallen dead tree stems (m^3/ha)

Fig. 3. The scatterplot matrix describing the interrelationships between the most important forest characterizing variables. Smoothing has been done using DWLS-method with the tension of 0.5.

sample of the forest stands and the corresponding distributions of forests in Lapland and in the whole country, reveal that the sample of stands represent rather well the forests of the country and fairly well the forests of Lapland considering these two characteristics (Fig. 4).

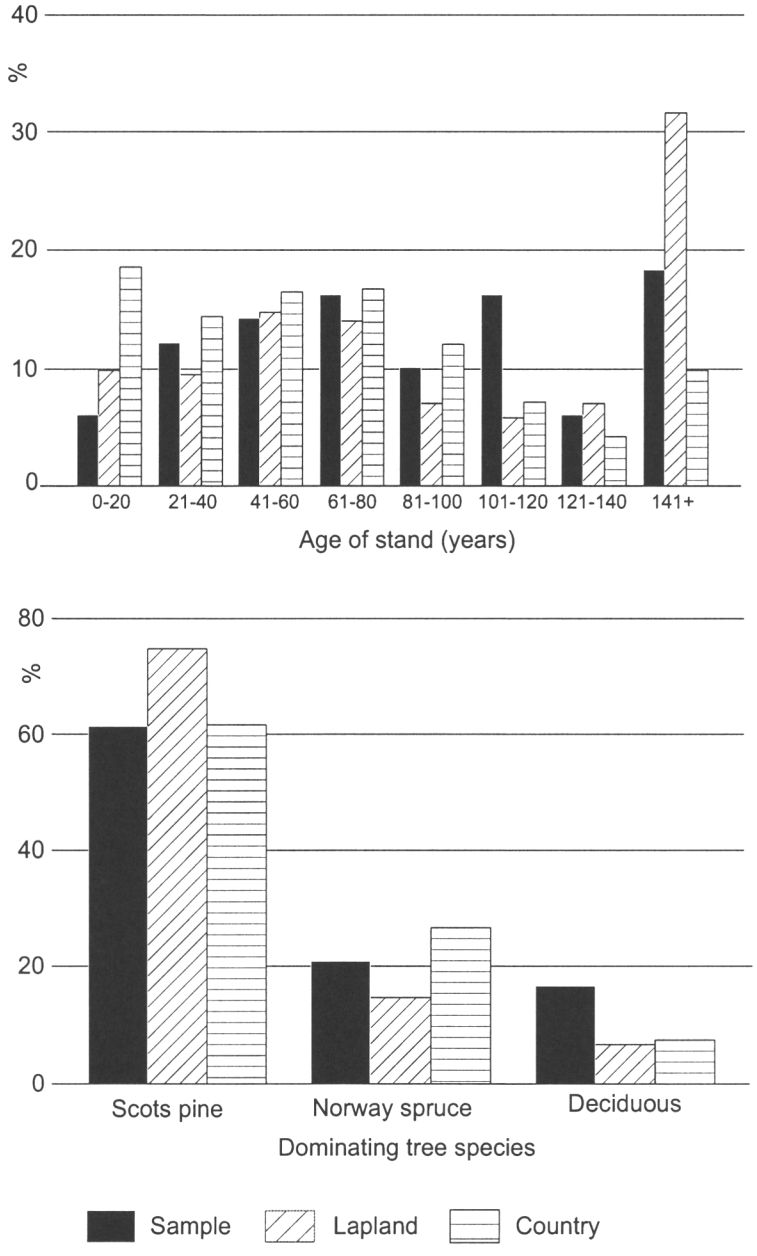


Fig. 4. The age and tree species dominance distribution of the forest stands compared with the forest areal distribution of Lapland and the whole country. The source of the distributions of Lapland and the country is Metsätilastollinen vuosikirja 1992.

5.2 The respondents

The respondents of Data Set 1 represent the Finnish population fairly well. The situation is, however worse with Data Set 2. In both of the data sets, sex and age distributions represents fairly well the Finnish population. In Data Set 1, the distributions of education, socioeconomic status and education are rather similar to those distributions of the population. Farmers are slightly over represented in the data set. Furthermore, in Data Set 1 the population of northern and eastern Finland is emphasized. The same can be said about the areal distribution of the respondents of Data Set 2. The respondents in the latter data set are younger and better educated than the Finnish population in general. Furthermore, they represent more often technical, scientific, agricultural and forestry occupations, or they are students and they have higher socioeconomic status. Administrative, transportation and industrial work is underrepresented, as well as the social status of other entrepreneurs than farmers (called entrepreneurs) or home-makers (Fig. 5).

Cross-tabulations and log-linear models reveal some interrelationships between the variables describing the background of the respondents (Tables 3, 4, 5). Many significant interrelationships that have been found between the pairs of variables in Table 3 are caused by a third variable. When a significant interrelationship between the two variables remains significant in the log-linear analysis of all three variable combinations (Tables 4 and 5), it means that the interrelationship is not caused by the third variable. The significant interrelationships found in Tables 4 and 5 are illustrated in Figure 6 using a continuous line. These interrelationships are studied in more detailed in the following.

Because Data Set 1 is a random sample of the population, the interdependencies that are found between the variables (Fig. 6a) can be generalized more reliably than the interdependencies that are found in Data Set 2 (Fig. 6b) in which the sampling is not as random as in Data Set 1. The significant interrelationships that are found in both data sets are interrelationship between age and education, age and socioeconomic status, education and socioeconomic status, occupation and environment of residence, occupation and socioeconomic status.

The cross-tabulations reveal that the older respondents are less educated than the younger ones. There are more students amongst the younger respondents than amongst the older ones. The bigger portion of the latter mentioned persons are farmers and/or they are working in forests and fields. Middle-aged respondents as well as the oldest persons are most often higher or lower white-collar employees. Blue-collar employees dominate among the respondents of Data Set 1 (about 30 %). In Data Set 2, the portion of the blue-collar employees among the respondents whose age is under 60 years is about 25 %. In the age class of 60 years or more, the portion is about 10 %. In the both data sets, the biggest part of the higher white-collar employees

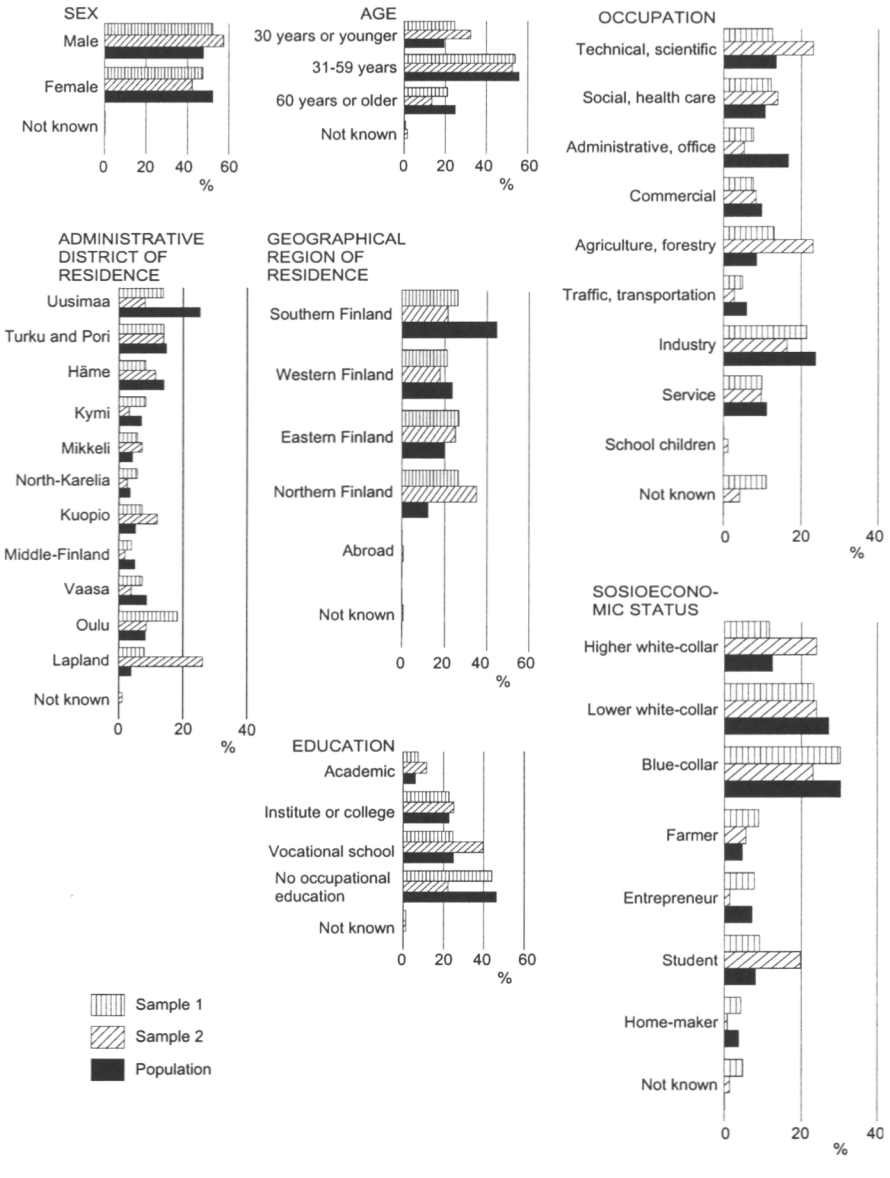


Fig. 5. The representativiness of sample 1 (Data Set 1) and sample 2 (Data Set 2) compared with the Finnish population. The sources characterizing the Finnish population are Suomen työvoimatutkimus 1990, ref. Siitonen, H. 1993, personal comment, Tilastokeskus 1991a and Tilastokeskus 1991b.

Table 3. The interrelationships between the variables characterizing the background of the respondents revealed by Pearson's chi-square test. The upper line in a cell denotes the significance in Data Set 1 and lower line in Data Set 2. Significance levels are: *: $p<0.050$, **: $p<0.010$, ***: $p<0.001$, ns.: not significant.

Variable	Sex	Age	Education	Socio-economic status	Occupation	Environment of residence	Geographical region of residence	Environment of residence in childhood	Geographical region of residence in childhood
Sex	–	ns. ns.	ns. ***	*** ***	*** ***	ns. ns.	ns. ns.	ns. ns.	ns. ns.
Age (classified, three classes)		–	*** ***	*** ***	*** ns.	* *	* ***	*** **	* ***
Education (classes: primary school, junior high school and high school graduate)			–	*** ***	*** ***	*** *	*** ***	*** ***	** *
Socioeconomic status (classes: other entrepreneurs than farmers and home-makers excluded in Data Set 2)				–	*** ***	*** ***	*** ***	*** ***	* ***
Occupation (classes health-social, administrative, commercial and service combined in Data Set 2)					–	*** ***	*** ***	*** ***	** ***
Environment of residence						–	*** *	*** ***	* *
Geographical region of residence							–	*** *	*** ***
Environment of residence in childhood								–	*** *

Table 4. The interdenpendencies between the variables characterizing the background of the respondents of Data Set 1 revealed by log-linear models. The p-value of a model denotes the value of best fitting model generated by backward stepwise analysis.

Variables	P-value of partial chi-square analysis testing parameters						P-value of 3-way interaction	P-value of model		Max. absol. value of standardized residuals
(A/B/C)	A	B	C	A*B	A*C	B*C		Pearson chi-square	Log-likelihood	
Age/Educ./Env. of resid.	.000	.000	.000	.000	.086	.000	.631	.176	.298	1.46
Age/Educ./Geo. reg. of resid.	.000	.000	.044	.000	.052	.001	.742	.272	.272	1.97
Age/Educ./Soc.econ.	.000	.000	.000	.000	.000	.000	.000	.060	.000	6.83
Age/Educ./Occup.	.000	.000	.000	.000	.001	.000	.683	.506	.683	1.20
Age/Env. of res./Geo. reg. of res.	.000	.000	.062	.036	.054	.000	.486	.160	.150	2.20
Age/Env. of res./Soc.econ.	.000	.000	.000	.220	.000	.000	.061	1.000	1.000	.00
Age/env. or res/Occup.	.000	.000	.000	.502	.000	.000	.217	.216	.279	1.91
Age/geo. reg. of res./Soc.econ.	.000	.024	.000	.295	.000	.000	.502	.460	.400	2.11
Age/Geo. reg. of res./Occup.	.000	.050	.000	.159	.000	.000	.579	.362	.399	1.61
Age/Soc. econ./Occup.	.000	.000	.000	.000	.530	.000	.842	.713	.740	3.29
Educ./Env. of res./Geo. reg. of res.	.000	.000	.040	.000	.045	.000	.684	.699	.684	1.47
Educ./Env. of res/Soc.econ.	.000	.000	.000	.112	.000	.000	.166	.080	.050	2.59
Educ./Env. of res./Occup.	.000	.000	.000	.043	.000	.000	.982	.933	.982	.92
Educ./Geo. reg. of res./Soc.econ.	.000	.015	.000	.126	.000	.001	.672	.450	.464	1.76
Educ./Geo. reg. of res./Occup.	.000	.039	.000	.060	.000	.002	.130	.043	.031	2.43
Educ./Soc.econ./Occup.	.000	.000	.000	.000	.191	.000	.912	.756	.491	3.41
Env. of res./Geo. reg. of res./Soc.econ.	.000	.022	.000	.001	.000	.015	.120	.058	.120	2.40
Env. of res./Geo. reg. of res./Occup.	.000	.050	.000	.000	.000	.046	.139	.088	.139	2.29
Env. of res./Soc.econ./Occup.	.000	.000	.000	.008	.000	.000	.632	.436	.631	1.53
Geo. reg. of res./Soc.econ./Occup.	.014	.000	.000	.054	.439	.000	.266	.177	.308	2.19

Abbreviations:
Educ. = Education
Env. of res. = Environment of residence
Geo. reg. of res. = Geographical region of residence
Soc.econ. = Socioeconomic status
Occup. = Occupation
Max. abso. value = Maximum absolute value

Table 5. The interdependencies between the variables characterizing the background of the respondents of Data Set 2 revealed by log-linear models. The p-value of a model denotes the value of best fitting model generated by backward stepwise analysis.

Variables	P-value of partial chi-square analysis testing parameters						P-value of 3-way interaction	P-value of model		Max. absol. value of standardized residuals
(A/B/C)	A	B	C	A*B	A*C	B*C		Pearson chi-square	Log-likelihood	
Age/Educ./Env. of resid.	.000	.001	.000	.000	.000	.000	.584	.601	.585	1.56
Age/Educ./Geo. reg. of resid.	.000	.001	.000	.000	.000	.037	.947	.919	.946	.85
Age/Educ./Soc.econ.	.000	.001	.000	.000	.000	.000	.981	.846	.981	1.05
Age/Educ./Occup.	.000	.005	.000	.000	.000	.000	.024	.235	.024	3.73
Age/Env. of res./Geo. reg. of res.	.000	.000	.000	.021	.000	.057	.394	.195	.157	2.05
Age/Env. of res./Soc.econ.	.000	.000	.000	.016	.000	.000	.448	.260	.448	1.36
Age/env. or res/Occup.	.000	.000	.000	.061	.134	.000	.591	.304	.357	2.25
Age/geo. reg. of res./Soc.econ.	.000	.000	.000	.000	.000	.000	.116	.408	.116	3.77
Age/Geo. reg. of res./Occup.	.000	.000	.000	.000	.054	.000	.112	.027	.041	3.18
Age/Soc. econ./Occup.	.000	.000	.000	.000	.170	.000	.068	.727	.519	2.49
Educ./Env. of res./Geo. reg. of res.	.001	.000	.000	.011	.000	.026	.469	.430	.469	1.28
Educ./Env. of res/Soc.econ.	.000	.000	.001	.434	.000	.000	.339	.247	.353	1.53
Educ./Env. of res./Occup.	.001	.000	.000	.479	.000	.000	.134	.132	.155	2.16
Educ./Geo. reg. of res./Soc.econ.	.000	.000	.000	.001	.000	.000	.784	.645	.784	1.34
Educ./Geo. reg. of res./Occup.	.000	.000	.001	.000	.000	.000	.031	1.000	1.000	.00
Educ./Soc.econ./Occup.	.000	.000	.000	.000	.000	.000	.988	.971	.988	1.35
Env. of res./Geo. reg. of res./Soc.econ.	.000	.000	.000	.104	.000	.000	.002	1.000	1.000	.00
Env. of res./Geo. reg. of res./Occup.	.000	.000	.000	.063	.000	.000	.034	1.000	1.000	.00
Env. of res./Soc.econ./Occup.	.000	.000	.000	.086	.027	.000	.991	.731	.790	2.22
Geo. reg. of res./Soc.econ./Occup.	.000	.000	.000	.000	.001	.000	.877	.783	.877	2.42

Abbreviations:
Educ. = Education
Env. of res. = Environment of residence
Geo. reg. of res. = Geographical region of residence
Soc.econ. = Socioeconomic status
Occup. = Occupation
Max. abso. value = Maximum absolute value

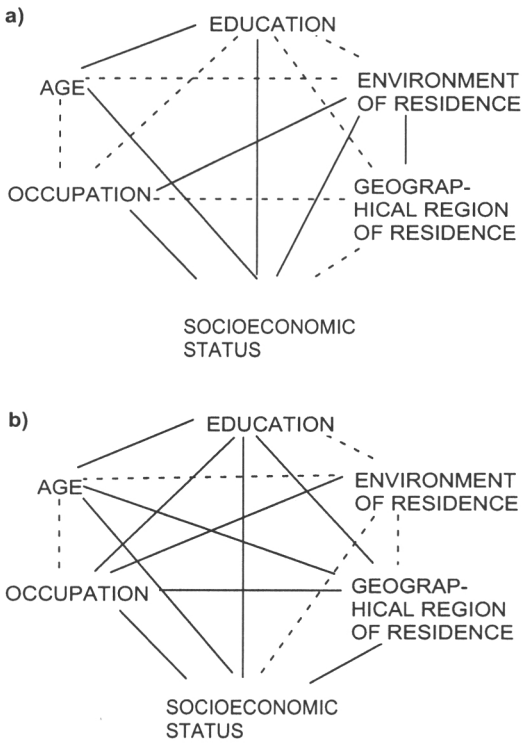


Fig. 6. A schematic diagram illustrating the interrelationships between the variables characterizing the background of the respondents of Data Set 1 (a) and Data Set 2 (b). the continuous line denotes the statistically significant (using 5 % risk level) interrelationship between the variables in the all log-linear models (see Tables 4 and 5). The interrupted line denotes the significant interrelationships in some but not all of the models.

work in technical or scientific occupations, and about one third of them in social occupations or in public health, administration or commercial occupations. About 60 % of the lower white-collar employees work in health, social, administrative or commercial occupations. Members belonging to the entrepreneurs usually work in commercial or technical occupations. Most of the students of Data Set 1 were studying scientific or technical subjects and about one-fifth of the students, health or social trades. Correspondingly, the majority of the students of Data Set 2 study agriculture or forestry and one fifth of them health or social occupations. A respondent who is living in a town or a city usually works in scientific or technical (about 20–30 %), health care or social (nearly 20 %), commercial (about 10%) or industrial (about 15–20 %) occupations. About 40 % of the respondents living in the countryside work in forests and fields. A village dweller resembles a city dweller more than a countryside dweller, although the portion of forest and field workers is higher among the village dwellers than the city dwellers.

In Data Set 1, about 70 % of the respondents who are living in the southern part of the country are city dwellers. In other parts of the country, the proportion is slightly over one-third of the respondents, being nearly the same as the portion that lives in the countryside in other parts of the country except in the southern part, where the proportion of countryside dwellers is about one-sixth. In Data Set 2, the proportion of city dwellers is 60% in southern and eastern Finland, about 40 % in western Finland and about 50 % in the northern part of the country. On the other hand, one-third of the respondents living in western Finland live in the countryside, the proportion being about 20 % in other parts of the country. A big proportion of the respondents of eastern and northern Finland live in Rovaniemi or Iisalmi, of which both were the places of the slide show.

There are also some differences in the relationships between education and occupation of the respondents in both of the data sets. The respondents of social and health care occupations are higher educated in Data Set 2. This is caused by the Rovala subset. A great deal of the students of Rovala studied social sciences and were high school graduates. The respondents of northern Finland are remarkably higher educated in Data Set 2 than they are in Data Set 1. Further, a great deal of the respondents of Data Set 2 who are working in agriculture or forestry are rather highly educated forest planners or they were forestry students at the moment of the questionnaire. The respondents representing these occupations in Data Set 1 are lower educated farmers. Nearly 90% of the farmers of Data Set 1 live in the countryside and 5 % in towns or cities, the corresponding proportions being 60 % and 30 % in Data Set 2. Furthermore, the respondents of Data Set 2 who are living in western, and particularly in northern Finland, are younger than the corresponding respondents of Data Set 1. In Data Set 2, there are plenty of students among those respondents living in the north. Thus the respondents of northern and western Finland are remarkably more highly educated in Data Set 2 than in Data Set 1.

In both data sets, most of the respondents that live in the countryside have lived there during their childhood as well. On the other hand, many of those who have spent their childhood in the countryside have left the countryside for a city or a town. From 60 % to 85 % of the respondents live in the same geographical region where they have lived during their childhood.

Cross-tabulations with the further analysis reveal that the only interdependencies concerning the variable sex, are the interdependencies between sex and socioeconomic status, sex and occupation, and in Data Set 2, the interdependency between sex and education (Tables 3, 4 and 5). As it was mentioned earlier, socioeconomic status and occupation as well as socioeconomic status and education are closely related to each other. In Data Set 2, the connection between occupation and education was found as well. In general, it can be said that men are more likely to belong to the entrepreneurs and work in transportation, agriculture and forestry or industry com-

pared with women. On the other hand, a bigger proportion of women work in health care and social occupations, and administrative or service trades, belonging to the lower white-collar employees. Moreover, a bigger portion of women compared to men take care of house duties. Furthermore, women are more highly educated than men among the respondents of Data Set 2, the difference being statistically non-significant in Data Set 1.

5.3 The difficulty of the questions and reasons to be a non-respondent

The respondents of Data Set 1 were asked about the *difficulty of the questions*. About one fourth of them regarded the questions as very easy, slightly over half as easy, one fifth as rather difficult and slightly under 3 % as very difficult. The differences between the groups of the respondents were analyzed using Pearson's chi-squared test. The statistically significant differences of under a 5 % risk level are presented in the following.

Females regarded the questions as more difficult than males did. The same can be said about the lowest educated group (primary school or less) compared with the highest educated group (high school graduates). On the other hand, rather low proportion of the academically educated respondents regarded the questions as very easy. The biggest proportion of the respondents who shared this opinion is among the lowest educated persons than in the other groups. Furthermore, many of those respondents who had no opinion about the adequacy of the coverage of the Finnish wilderness areas felt it more difficult to answer the questions than those persons who had an opinion. On the other hand, among those who argue that the extent of wilderness areas in Finland is too much, there is a rather big proportion of those who regarded the questions as very easy and a big proportion of those who regarded the questions as difficult. The respondents' wilderness experiences reflect the opinion as well; those who have visited wilderness found it easier to answer the questions compared with those who have not visited.

To find out the reasons why a rather big proportion of the sampled people *did not respond* to Questionnaire Number 1, a random sample of the persons was interviewed by telephone. Although the sample is rather small, the regional distribution of the sample is rather good. Fourteen of the persons are female and sixteen are male. The age of twenty-seven persons, the socioeconomic status of twenty-four persons and the occupation of twenty-two persons were found out.

Among those interviewed persons, whose age was found out, there were 22.2 % sixty years old or older. This is nearly the same proportion as among the respondents (21.3 %) On the other hand, 48.2 % of the interviewed belonged to the age group of from forty-one to fifty-nine years old. This proportion is remarkably higher than the proportion among the respondents

(35.7 %). The respondents belonging to the age group of forty years or younger, may have answered a little more keenly than those belonging to the middle-aged persons, 29.6 % of the interviewed persons belong to the youngest age group. The same proportion of the respondents is 43.1 %. The p-value of Pearson's chi squared test is 0.306 revealing that the difference is, however, not statistically significant.

The distributions of the socioeconomic status among the interviewed persons and those who have answered reveal that a much bigger proportion of the interviewed persons belong to blue-collar employees than to the other groups (interviewed 66.7 and respondents 31.7 %). Furthermore, the proportion of lower white-collar employees among the interviewed persons is 29.2 % and the proportion of farmers 4.2 %. The corresponding proportions among the respondents are 24.3 and 9.3 %. The members of the other socioeconomic classes are lacking in the sample of interviewed persons. Because of low frequencies the statistical tests are not sufficient. The proportions give, however, some evidence that blue-collar employees may not have answered as conscientiously as the persons belonging to the other socioeconomic groups.

The proportions of the persons representing different occupations in the telephone interviewed sample are the following (the proportions among the respondents in parentheses): scientific or technical 0 % (14.1 %), social or health care 18.2 % (13.7 %), administrative or office 9.1 % (8.7 %), commercial 9.1 % (8.6 %), agriculture or forestry 4.6 % (14.6 %), traffic or transportation 13.6 % (5.5 %), industry 31.8 % (24.0 %), service 13.6 % (11.0 %). Although it may not be reasonable to test the differences statistically, it may be possible that persons who represent the occupations of social or health care, industry or especially traffic or transportation have not answered as conscientiously as those who are working in agriculture or forestry or in the scientific or technical occupations.

The regional distribution of the interviewed persons is the following (the proportions of the respondents in parentheses): southern Finland 17 % (26 %), western Finland 30 % (21 %), eastern Finland 23 % (27 %) and northern Finland 30 % (26 %). Thus, these numbers give some evidence that the dwellers of southern Finland have answered a little more conscientiously compared with the dwellers of western Finland. Pearson's chi-square test's p-value is 0.503 telling about statistically non-significant differences. Furthermore, the proportion of city dwellers is 40 % among the interviewed persons. This proportion is rather near the corresponding proportion of the respondents (45 %).

Forty % of the interviewed persons remembered that they had received the questionnaire, about fifty-three did not remember, and about seven % did not want to answer the question. Moreover, 43 % of the interviewed did not express if they had answered the questionnaire or not, 40 % told that they have not answered, 10 % claimed that they have answered and about

7 % did not remember if they had answered the questionnaire. When the interviewed persons were asked why they did not answer the questionnaire, one of them did not find any reasons. The other reason that have been mentioned were:

- the questionnaire was too difficult, included too many pages, was too time-consuming (3 persons)
- did not know enough about the wilderness (2 persons)
- the questionnaire was not regarded as necessary, too many questionnaires (1 person)
- the questions were leading (1person)
- the feeling that answers did not have an effect on things (1 person)
- the language was wrong (1 person)

6 Results

6.1 The concept of wilderness and scenic factors promoting wilderness experience

6.1.1 The open-ended definitional perception question

The responses to the open-ended definitional perception question in both data sets reveal that the respondents' dominant mental images of wilderness are roadless, uninhabited areas covered mainly with virgin forests. Mires, especially in their natural condition, are also mentioned fairly often. Wilderness areas must be silent and remote from roads and inhabited areas. In general, the area should be close to its natural condition (Fig. 7).

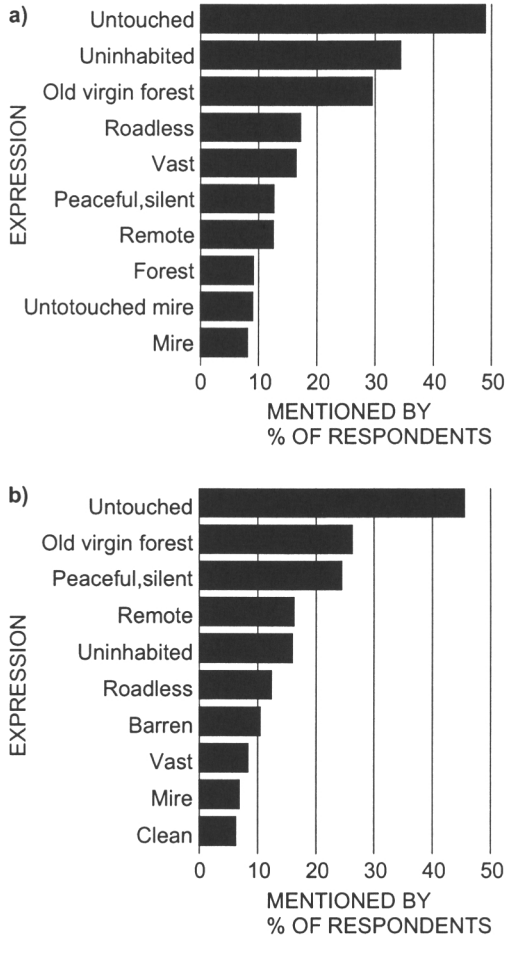


Fig. 7. The ten most often mentioned qualitative expressions which people connect with their mental images of wilderness according to Data Set 1 (a) and Data Set 2 (b). The number of respondents is 804 in Data Set 1 and 294 in Data Set 2.

The expressions of people with different backgrounds are fairly similar. Figures 8 and 9 reveal, however, some differences in the expressions describing wilderness between different groups of the respondents. In the mental images of young, educated and urban respondents, the expressions of untouched, silent and clean are emphasized. Furthermore, among young and

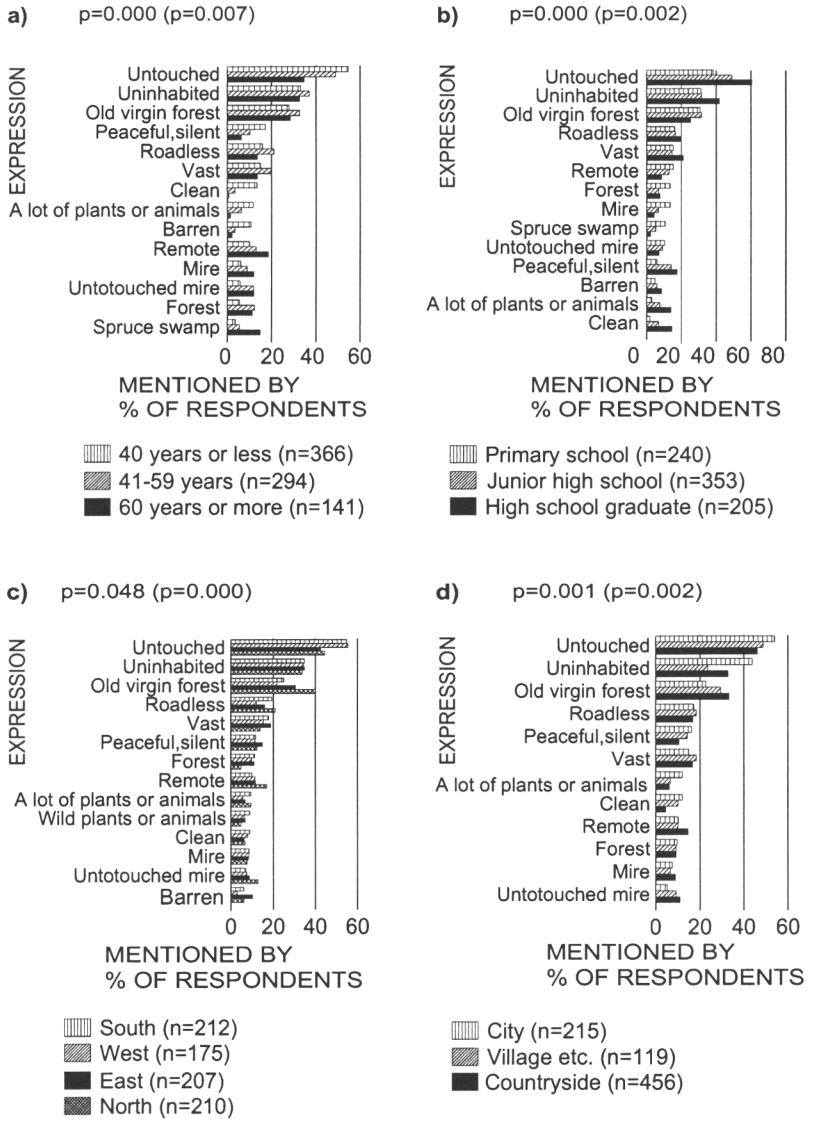
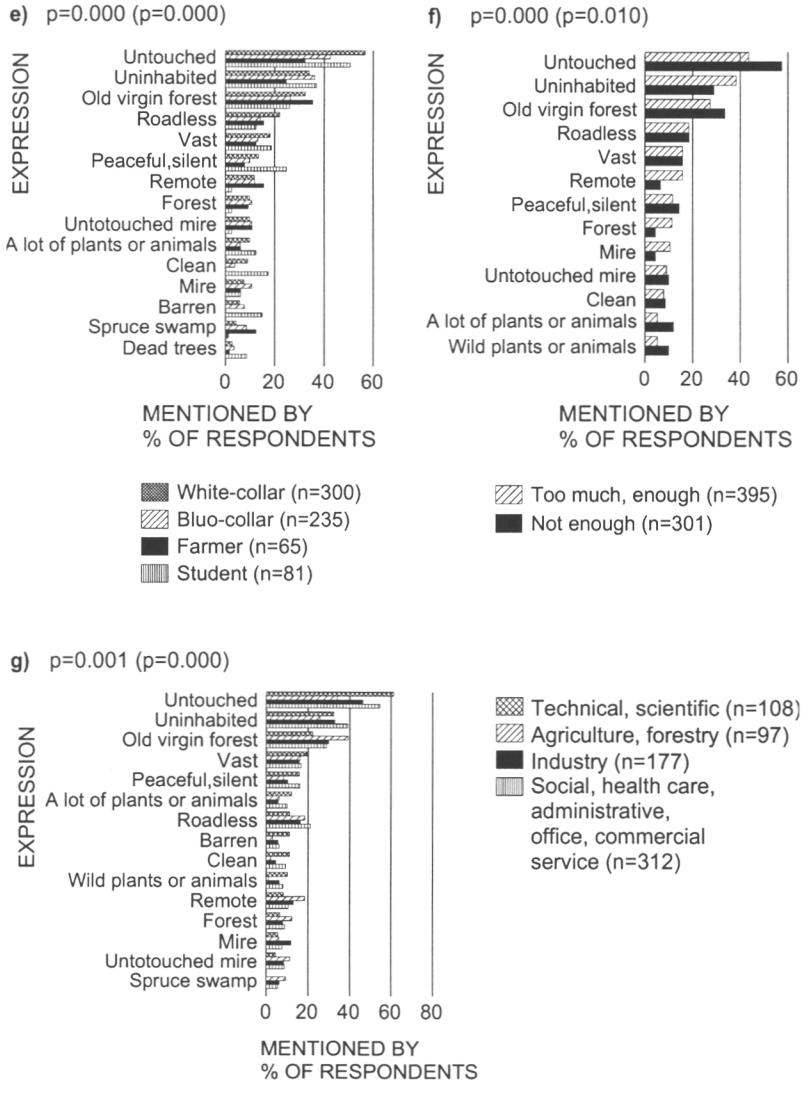


Fig. 8. The difference between the groups of the respondents of Data Set 1 in the expressions characterizing wilderness. The p-value of Pearson's chi-square test has been expressed without parenthesis and the p-value of Kendall's coefficient of concordance or Spearman's rank order correlation coefficient in parenthesis. Only the results with statistically significant differences using 5 % risk level have been published. The graphs continue on the next page.

Fig. 8. continues



highly educated respondents, and in Data Set 2, among the urban dwellers, the expression of barren is rather often mentioned. Highly educated persons and city dwellers also consider wilderness as an uninhabited area more often than countryside dwellers and lower educated persons do. In Data Set 1 the abundance of wildlife is emphasized as well by these respondents. On the other hand, old virgin forests, and in Data Set 1, remoteness are emphasized among the lower educated persons and the countryside dwellers.

The wilderness expressions of farmers and forest workers differ in some ways from the expressions of the other occupation groups. In both data sets, the respondents who are working in fields and forests emphasize old virgin forests as an important characteristic of wilderness. In Data Set 1, the re-

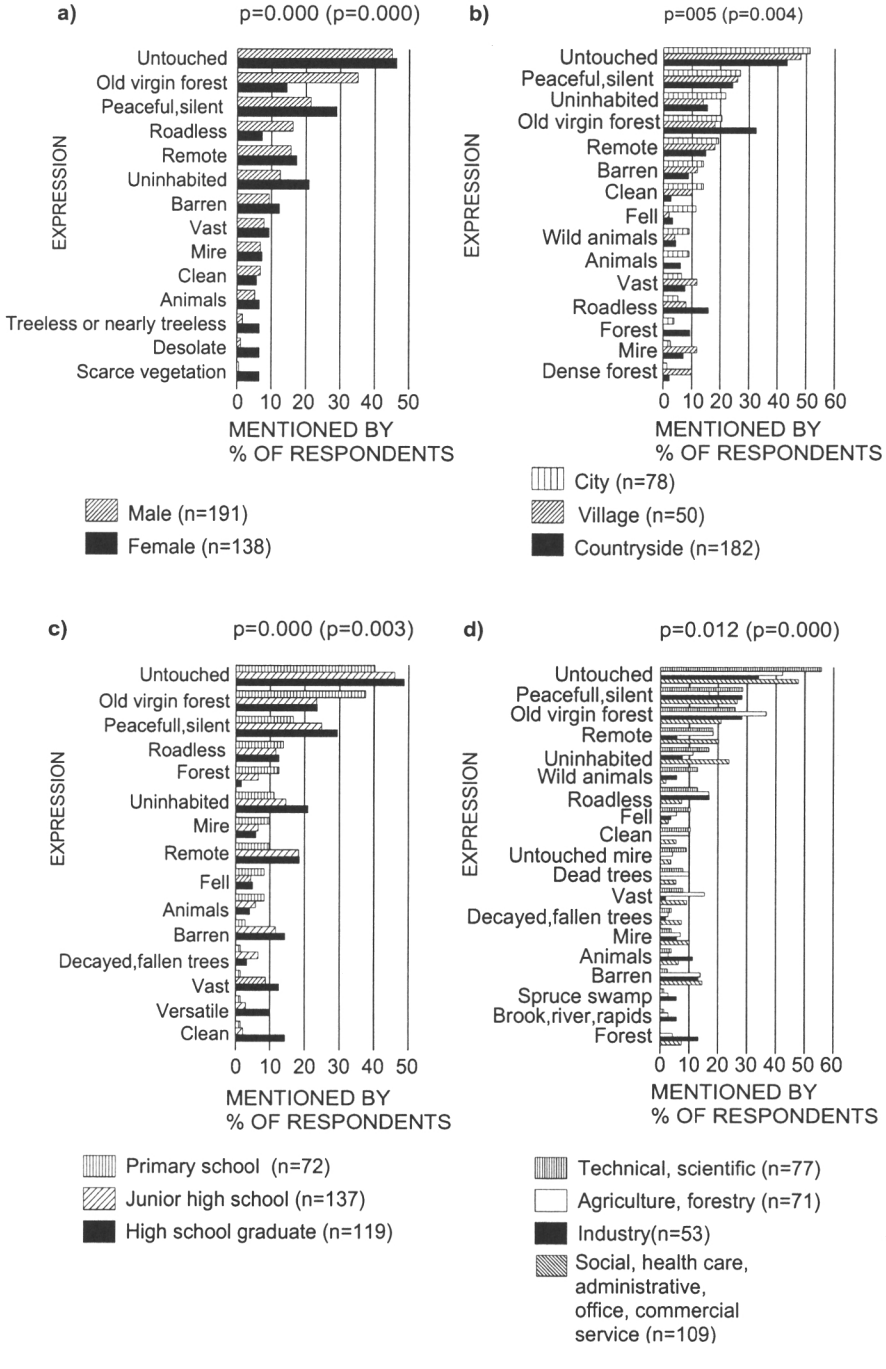


Fig. 9. The differences between the groups of the respondents of Data Set 2 in the expressions characterizing wilderness. The p-value of Pearson's chi-square test has been expressed without parenthesis and the p-value of Kendall's coefficient of concordance or Spearman's rank order correlation coefficient in parenthesis. Only the results with statistically significant differences using 5 % risk level have been published.

moteness, and in Data Set 2, the extent of wilderness is also emphasized by these respondents, but it is not necessary for them that wilderness should be very peaceful and silent, and in Data Set 1, clean, untouched and inhabited by wildlife. Furthermore, cleanliness and naturalness are not emphasized by the industrial workers of Data Set 2. On the other hand, technical, scientific and other office workers emphasize naturalness of wilderness, and wilderness as an uninhabited area.

Those respondents of Data Set 1 who wish for a greater extent of wilderness areas emphasize naturalness, old virgin forests and wildlife more than do those respondents who share the opinion that the extent of the areas in Finland is enough.

Some statistically significant differences in the wilderness expressions between men and women are found only in Data Set 2. The men emphasize old virgin forests and roadlessness while the women emphasize peace and silence. Furthermore, the women consider wilderness more often as a treeless, desolate, barren and uninhabited area than men do.

6.1.2 The images of the wilderness character of the verbally described forest stands

Seventeen forest stands have been described in Questionnaire 1 (Data Set 1, question number 16). The distributions of the evaluations (Fig. 10) and the multi-dimensional scaling as well as the principal component analysis (Fig. 11 and 12) reveal that old virgin forests and open mires in their natural condition are the best stands for wilderness experience. Matured stands without dead and fallen trees have a lot of wilderness character as well. Clear-cuts and young stands do not bring to mind wilderness at all to most of the respondents. The groups of the wilderness and non-wilderness forests have remarkably high internal consistency revealed by the Cronbach's alphas (Fig. 11). Furthermore, the respondents ranked the stand consisting of old virgin forest with a road, ditched open mire and open area with some old pines in a rather similar way. These stands are intermediate stands in the continuum of wilderness character, and they are separated in their own principal component in Figure 11, although the internal consistency of these items (forest stands) is rather low. According to these evaluations, different tree species do not have a remarkable effect on wilderness experience.

The results of the multi-dimensional scaling reveal that young and highly educated persons, as well as those who wish for the existence of more wilderness areas in Finland, and those persons who demand larger areas to stand for wilderness, appreciate the virgin forests and the other matured forests as a source of their wilderness experience. On the other hand, appreciation of the young stands as a part of a wilderness area correlates positively with the rural background and rural residence of a respondent (Fig 12).

To see the attitudes of different groups of the respondents towards the wilderness character of verbally described forest stands, four different forest stands described in question 16 (in Questionnaire 1) have been detached. The stands are: 1) an old spruce forest including dead and fallen trees, 2) an open area with fresh stumps, slash and parallel furrows on the ground, 3) an open mire with some old scattered pines and 4) an open mire with some old scattered pines and ditches in the scenery. The results of cross-tabulations using the evaluations of different groups of the respondents with Pearson's chi-square tests are presented using the attitude scale of 1) the stand impairs wilderness experience, 2) the stand has no effect on wilderness experience (neutral) and 3) the stand promotes wilderness experience.

The cross-tabulations in the form of bar charts with the tests reveal that the wilderness experience of the older and lower educated respondent is not so easily disturbed by the clear-cuts, plowing and mire ditching compared with the younger and higher educated persons (Fig. 13). Furthermore, old virgin spruce forests and mires in their natural condition have a stronger

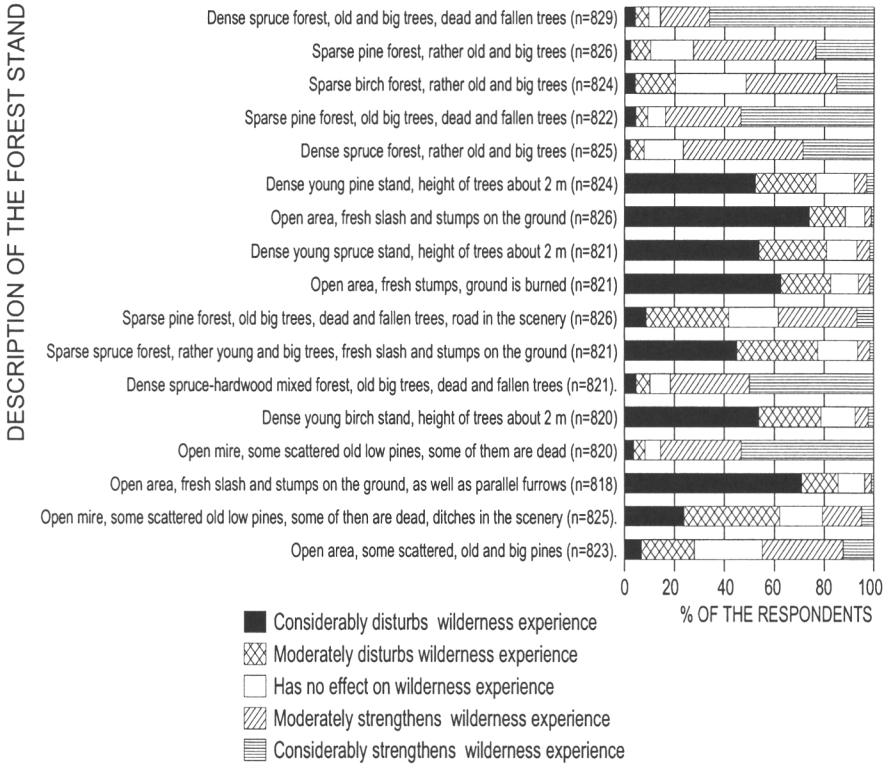
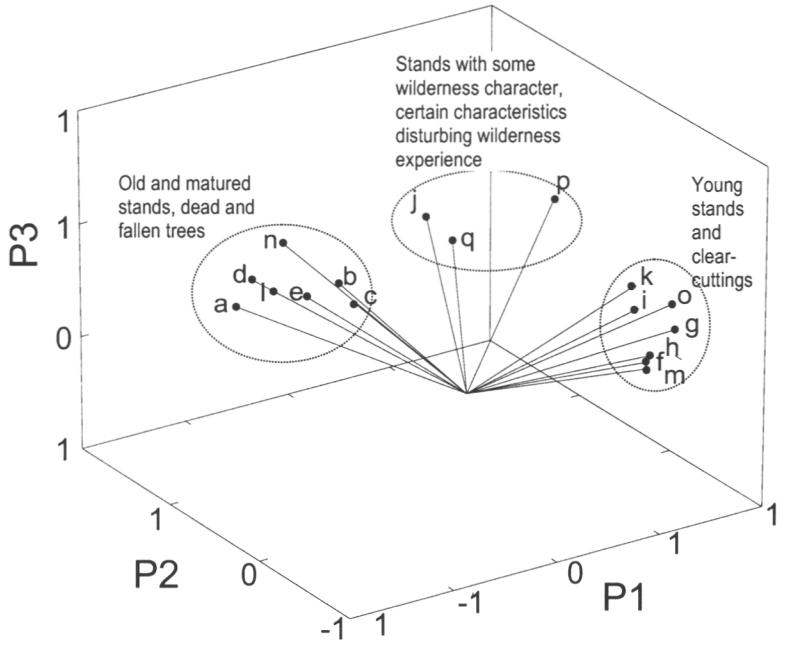
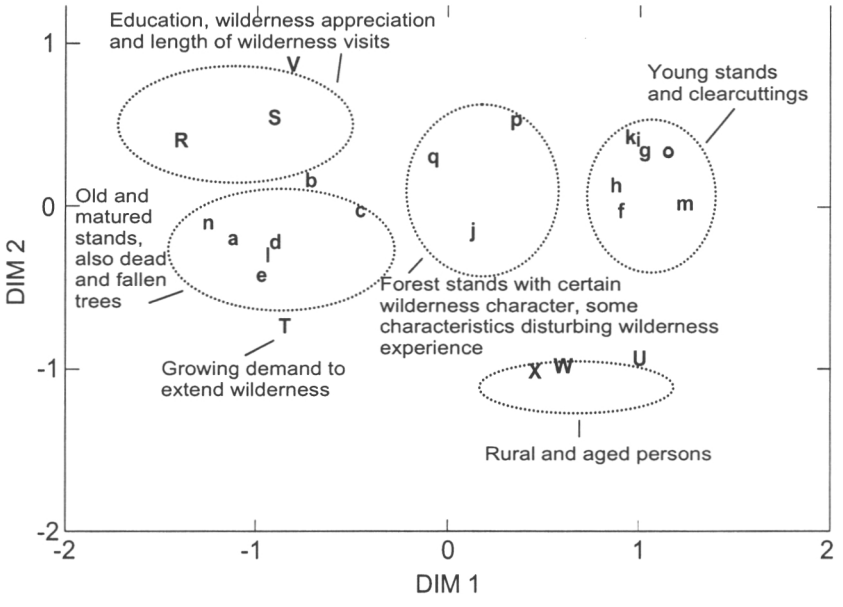


Fig. 10. The effect of some verbally described forest stands on the wilderness experience of the respondents of Data Set 1.



VARIABLE	SYMBOL	P1 (33.2%)	P2 (22.4%)	P3 (12.7%)
Dense spruce forest, old and big trees, dead and fallen trees	a	**-0.510**	**0.701**	0.162
Sparse pine forest, rather old and big trees.	b	0.071	**0.792**	0.081
Sparse birch forest, rather old and big trees.	c	0.148	**0.794**	-0.027
Sparse pine forest, old big trees, dead and fallen trees.	d	-0.410	**0.729**	0.245
Dense spruce forest, rather old and big trees.	e	-0.100	**0.778**	0.069
Dense young pine stand, height of trees about 2 m.	f	**0.880**	-0.003	-0.075
Open area, fresh slash and stumps on the ground.	g	**0.816**	-0.224	0.195
Dense young spruce stand, height of trees about 2 m.	h	**0.893**	-0.010	-0.044
Open area, fresh stumps, ground is burned.	i	**0.732**	-0.104	0.244
Sparse pine forest, old big trees, dead and fallen trees, road in the scenery.	j	0.021	0.250	**0.652**
Sparse spruce forest, rather young and big trees, fresh slash and stumps on the ground.	k	**0.792**	-0.022	0.293
Dense spruce-hardwood mixed forest, old big trees, dead and fallen trees.	l	-0.392	**0.625**	0.239
Dense young birch stand, height of trees about 2 m.	m	**0.842**	-0.045	-0.075
Open mire, some scattered old low pines, some of them are dead	n	-0.467	0.487	**0.539**
Open area, fresh slash and stumps on the ground, as well as parallel furrows.	o	**0.761**	-0.266	0.340
Open mire, some scattered old low pines, some of then are dead, ditches in the scenery.	p	0.289	-0.144	**0.853**
Open area, some scattered, old and big pines.	q	0.179	0.284	0.494
Cronbach's alpha		**0.892**	**0.832**	**0.444**

Fig. 11. The grouping of the verbally described forest stands based on the wilderness character of the stands. The principal component analysis with Varimax rotation has been used in the computation of the loadings. Spearman's rank order correlation matrix has been used as the source data in the analysis. The loadings with absolute value over 0.500 have been printed using bold.



VARIABLE	SYMBOL	DIM 1	DIM 2
Dense spruce forest, old and big trees, dead and fallen trees.	a	-1.10	-0.15
Sparse pine forest, rather old and big trees.	b	-0.51	0.08
Sparse birch forest, rather old and big trees.	c	-0.40	-0.02
Sparse pine forest, old big trees, dead and fallen trees.	d	-0.95	-0.09
Dense spruce forest, rather old and big trees.	e	-0.78	-0.31
Dense young pine stand, height of trees about 2 m.	f	1.04	0.09
Open area, fresh slash and stumps on the ground.	g	1.08	0.33
Dense young spruce stand, height of trees about 2 m.	h	1.05	0.10
Open area, fresh stumps, ground is burned.	i	0.96	0.37
Sparse pine forest, old big trees, dead and fallen trees, road in the scenery.	j	0.00	-0.07
Sparse spruce forest, rather young and big trees, fresh slash and stumps on the ground.	k	0.93	0.28
Dense spruce-hardwood mixed forest, old big trees, dead and fallen trees.	l	-1.00	-0.28
Dense young birch stand, height of trees about 2 m.	m	1.04	0.13
Open mire, some scattered old low pines, some of then are dead.	n	-1.04	0.00
Open area, fresh slash and stumps on the ground, as well as parallel furrows.	o	1.12	0.29
Open mire, some scattered old low pines, some of then are dead, ditches in the scenery.	p	0.55	0.59
Open area, some scattered, old and big pines.	q	0.08	0.31
Opinion about the number of wilderness areas (1=Too much, 2=Enough, 3=Too few)	R	-1.23	0.39
Length of wilderness visits (1=Day, 2=Weekend, 3=Longer than weekend)	S	-0.96	0.68
Growing demand to extent wilderness areas	T	-0.99	-0.77
Age (1= 40 years or younger, 2=41-59 years, 3=60 years or older)	U	0.99	-0.84
Education (1=Primary school, 2=Junior high school, 3=High school graduate)	V	-0.80	0.81
Growing rurality (1=City, 2=Village, 3=Countryside)	W	0.51	-0.86
Growing rurality during childhood (1=City, 2=Village, 3=Countryside)	X	0.43	-1.06

Fig. 12. The grouping of the verbally described forest stands based on the wilderness character of the stands as well as some variables describing the background of the respondents using the MDS. The polychoric correlation matrix has been used as the source data in the analysis.

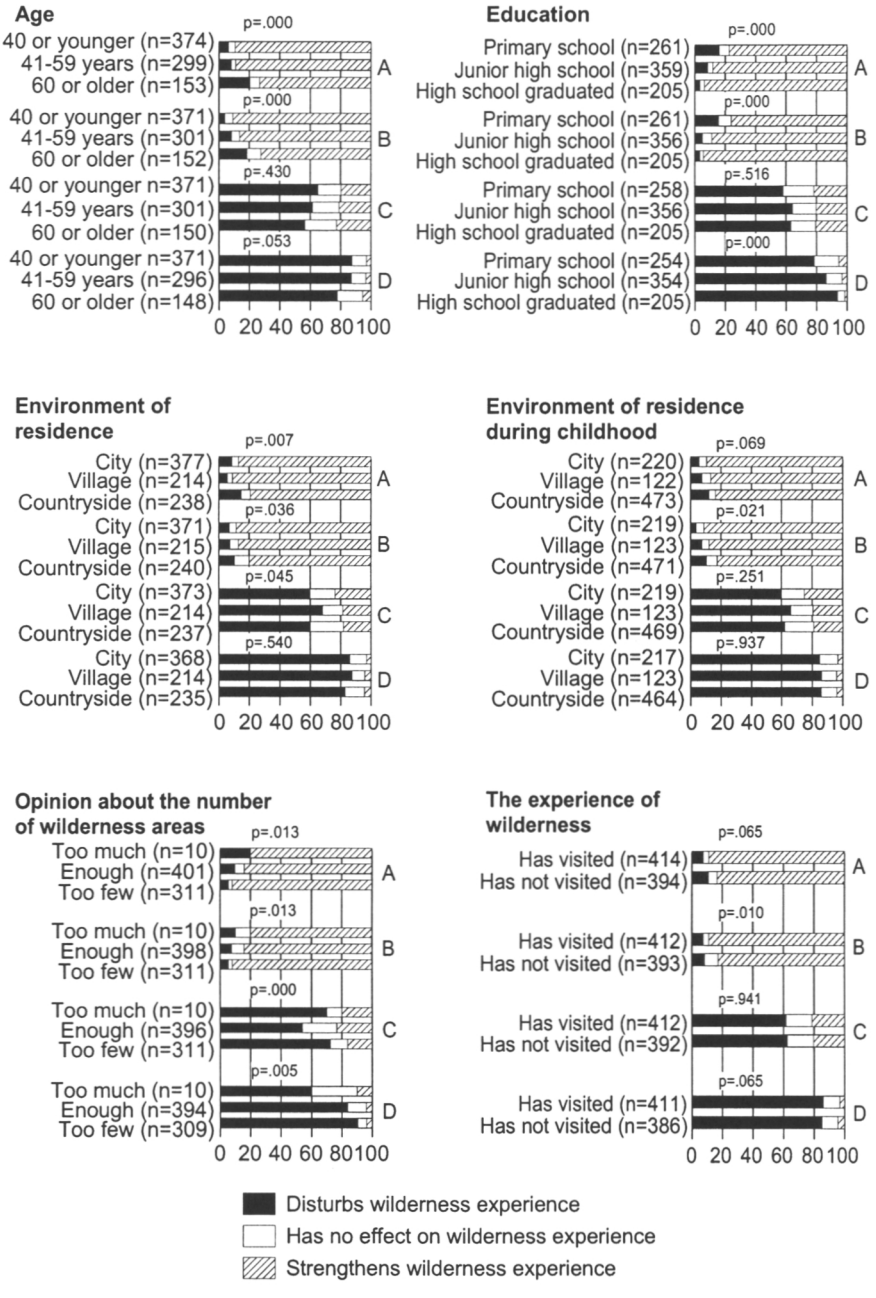


Fig. 13. The effect of the four verbally described forest stands on the wilderness experience of the respondents of Data Set 1 when the respondents have been classified into different groups. Only the groups with the statistically significant differences using 5 % risk level have been presented. The p-value denotes the p-value of Pearson's chi-square test. The graphs continue on the next page.

Figure 13 continues

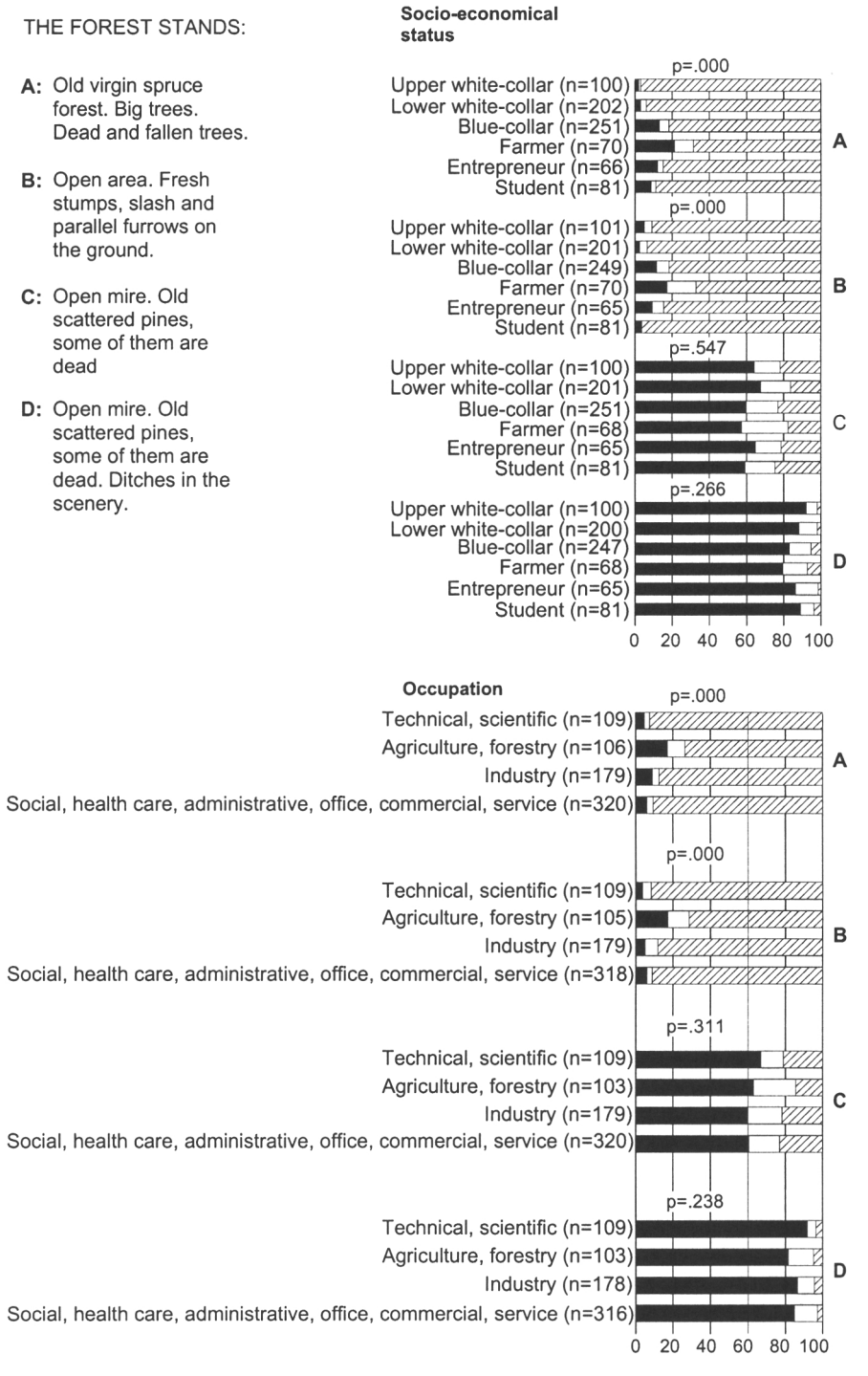
THE FOREST STANDS:

A: Old virgin spruce forest. Big trees. Dead and fallen trees.

B: Open area. Fresh stumps, slash and parallel furrows on the ground.

C: Open mire. Old scattered pines, some of them are dead

D: Open mire. Old scattered pines, some of them are dead. Ditches in the scenery.



effect on the wilderness experience of the young and rather highly educated respondents compared with the older and lower educated persons. The reactions of the countryside dwellers, and the respondents who share the opinion about the adequate coverage of the wilderness areas in Finland, resemble the reactions of old respondents. Old virgin spruce forests and open mires cannot provide as strong a wilderness experience for farmers and other agricultural or forestry workers as they can for the other occupation groups.

6.1.3 The desired extent of a wilderness area

The frequency analysis of questions number 14 and 15 in Data Set 1 reveal that slightly over half of the respondents experience that the diameter of a wilderness should be at least eight kilometers. About fourteen percent of respondents consider an area with a diameter of two kilometers as wilderness if the area consists of virgin forests. On the other hand, if the whole area has been artificially regenerated and currently consists of young stands, only a few respondents regard the area as wilderness, even if it is very large and roadless (Fig. 14).

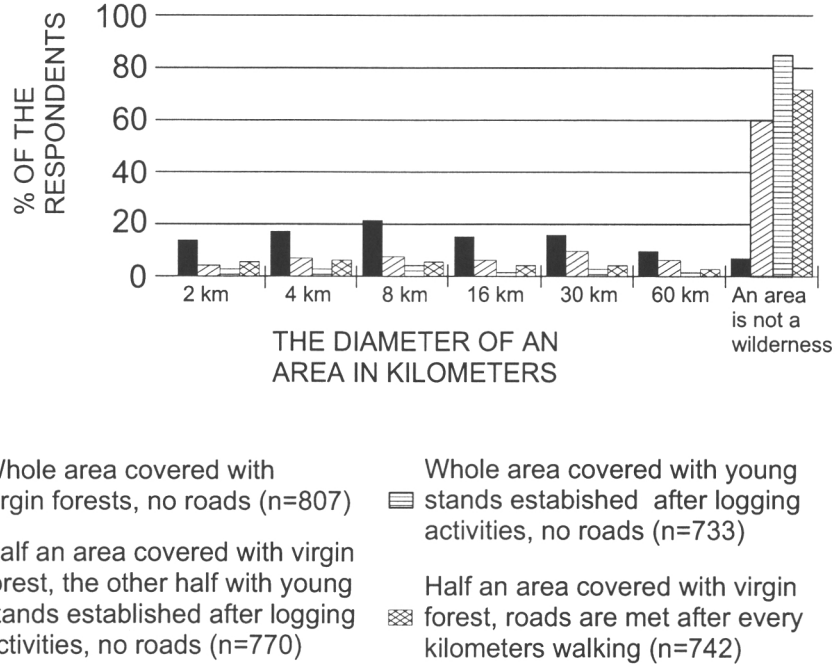


Fig. 14. The minimum extent of a Finnish wilderness area when the area consists of different kinds of forests according to the respondents of Data Set 1.

The comparisons between the different groups of the respondents in their opinion about the minimum diameter of a virgin forest wilderness reveal that the only statistically significant difference at a 5 % risk level using Pearson's chi-square, is the difference between those respondents who have different opinions about the extent of wilderness areas in Finland, and those who make wilderness visits of different lengths (Table 6). Small areas are considered as wilderness to those respondents who do not want to increase the extent of wilderness areas in Finland, or to the respondents without an opinion about it. A great deal of the respondents belonging to the latter group have an image of rather large wilderness areas. Furthermore, those respondents who make rather long-lasting wilderness visits have more often greater demands for the extent of a wilderness area compared with those who make shorter visits. Although the groups having different education do not differ remarkably from each other according to the chi-square statistics, there is a statistically significant trend: higher educated respondents have more demands about the size of a wilderness area.

In the case where half of a forest area consisting virgin forest will be regenerated, slightly over half of the respondents do not consider the area as wilderness despite its size (Fig. 14). Some differences between the groups of the respondents are found; countryside dwellers and men consider the half-regenerated area as wilderness more often than those persons representing the reference groups do. Furthermore, the test of Cochran's linear trend reveals that a negative attitude towards wilderness areas like this is connected to higher educational levels and a respondent's wish to preserve more wilderness areas in Finland. Although Pearson's chi-square test does not reveal significant differences between the occupation groups, it is remarkable that agricultural and forestry workers accept the regeneration activities clearly more often than the respondents representing the other groups do (Table 7).

Differences between the groups of the respondents towards a completely regenerated forest area are found. Decreasing age as well as increasing education and urbanization level increases the negative attitudes towards the wilderness areas that consist of regenerated, young forest stands. The respondents that represent occupation groups of service, transportation, agriculture and forestry accept the forest regeneration activities more often than the respondents of the other groups do. The respondent's who wish for a greater extent of wilderness increase the negative attitude towards forest regeneration activities in wilderness areas (Table 7).

The attitude towards roads crossing wilderness areas is rather similar between the groups of the respondents. However, those persons who wish for more wilderness areas as well as those who make overnight wilderness visits as well as those respondents who live in the southern and western parts of Finland do not accept roads in their wilderness areas like the members of the reference groups do (Table 7).

Table 6. The differences between the groups of the respondents in considering the areas of different sizes as wilderness when the areas consist of old virgin forests and there are no roads.

The group of the respondents		n	Minimum diameter of the area in kilometers, % of the respondents			The area is not a wilderness, % of the respondents	p-value
Grouping variable	Groups		2–4 km	8–16 km	30–60 km		
Sex	Male	435	29.0	39.3	25.5	6.2	.340
	Female	371	32.6	33.4	26.4	7.5	–
Age	40 years or younger	365	27.7	40.0	25.8	6.6	.296
	41–59 years	298	31.9	33.2	28.5	6.4	*.389*
	60 years or older	140	35.7	34.3	21.4	8.6	
Education	Primary school	246	37.4	34.6	20.7	7.3	.106
	Junior high school	354	28.5	37.9	26.8	6.8	***.022***
	High school graduate	201	26.4	36.3	30.8	6.5	
Environment of residence	City	367	30.0	35.4	27.8	6.8	.673
	Village	208	31.3	37.5	26.4	4.8	*.688*
	Countryside	232	31.0	37.5	22.8	8.6	
Environment of residence during childhood	City	219	29.2	36.1	27.4	7.3	.965
	Village	119	31.9	39.5	22.7	5.9	*.595*
	Countryside	454	31.1	36.6	25.8	6.6	
Geographical region of residence	Southern	212	28.3	34.9	29.2	7.5	.457
	Western	170	29.4	37.6	27.1	5.9	–
	Eastern	213	35.7	32.4	23.5	8.5	
	Northern	212	28.8	41.5	24.5	5.2	
Geographical region of residence during childhood	Southern	170	32.4	33.5	26.5	7.6	.572
	Western	160	29.4	36.3	30.0	4.4	–
	Eastern	212	32.1	35.8	23.1	9.0	
	Northern	193	31.1	39.9	24.4	4.7	
Socioeconomic status	Higher white-collar	101	31.7	32.7	28.7	6.9	.908
	Lower white-collar	196	31.6	32.1	29.1	7.1	–
	Blue-collar	243	29.2	39.5	25.5	5.8	
	Farmer	67	32.8	35.8	22.4	9.0	
	Entrepreneur	62	30.6	41.9	22.6	4.8	
	Student	79	27.8	38.0	24.1	10.1	
	Home-maker	27	40.7	40.7	11.1	7.4	
Occupation	Technical, scientific	108	28.7	35.2	28.7	7.4	.765
	Social, health care	100	33.0	30.0	30.0	7.0	–
	Administrative, office	65	29.2	35.4	29.2	6.2	
	Commercial	67	23.9	40.3	25.4	10.4	
	Agriculture, forestry	102	31.4	35.5	26.5	6.9	
	Traffic, transportation	38	23.7	28.9	42.1	5.3	
	Industry	175	30.3	44.0	20.6	5.1	
	Service	78	33.3	35.9	25.6	5.1	
Opinion about the coverage of the wilderness areas in Finland	Too much or enough	403	32.8	36.0	24.1	7.2	**.001**
	Too few	308	26.0	43.2	25.0	5.8	.157*
	I cannot say	94	37.2	18.1	37.2	7.4	*.431**
The length of respondent's typical wilderness visit	Day (2–10 hours)	248	49.2	32.3	11.7	6.9	**.000**
	Weekend (1–2 days)	110	30.9	40.9	21.8	6.4	***.000***
	Longer (3 days or more)	100	13.0	45.0	36.0	6.0	

Abbreviations and notes in the table:

The p-values are: normal font denotes the value of Pearson's chi-square test, italic font denotes the value of Mantel-Haenzels's test of linear trend, bold means statistically significant values using 5 % risk level, the p-values with asterisks denotes the values when the class "I cannot say" is excluded in the test. N denotes the number of cases.

Table 7. The differences between the groups of the respondents regarding some managed forest areas as wilderness areas.

The group of the respondents		M 1			M 2			M 3		
Grouping variable	**Groups**	%	n	p	%	n	p	%	n	p
Sex	Male	45.1	415	**.003**	16.7	390	.226	29.5	396	.385
	Female	34.6	435		13.5	342	–	26.7	345	–
Age	40 years or younger	38.0	353	.371	10.6	348	**.006**	28.9	349	.750
	41–59 years	40.7	285	*.163*	18.0	267	***.002***	26.4	273	*.821*
	60 years or older	45.0	129		20.9	115		29.1	117	
Education	Primary school	44.6	233	.065	24.1	216	**.000**	31.2	218	.382
	Junior high school	40.0	337	***.023***	11.3	319	***.000***	25.8	326	*.511*
	High school graduate	33.7	196		11.4	193		28.5	193	
Environment of residence	City	39.9	343	**.003**	13.9	331	**.014**	30.6	337	.160
	Village	32.0	203	*.100*	10.9	192	***.046***	22.9	192	*.557*
	Countryside	48.2	224		21.0	210		29.1	213	
Environment of residence during childhood	City	39.7	209	.443	10.8	203	.056	32.0	206	.383
	Village	35.6	118	*.476*	12.9	116	***.018***	27.2	114	*.194*
	Countryside	42.0	431		17.9	402		26.8	410	
Geographical region of residence	Southern	38.3	206	.597	13.7	197	.552	25.1	199	**.049**
	Western	40.7	167	–	12.7	158	–	22.2	158	–
	Eastern	38.1	197		17.5	189		34.6	191	
	Northern	44.0	200		16.4	189		29.9	194	
Geographical region of residence during childhood	Southern	42.5	167	.739	14.5	159	.907	28.6	161	.472
	Western	39.1	156	–	13.4	149	–	24.7	150	–
	Eastern	38.1	197		16.0	188		32.3	192	
	Northern	42.7	185		15.8	177		30.3	178	
Socioeconomic status	Upper white-collar	31.6	95	.131	15.4	91	.119	27.7	94	.484
	Lower white-collar	37.8	188	–	14.4	181	–	26.3	179	–
	Blue-collar	41.1	231		16.9	219		32.6	224	
	Farmer	55.6	63		24.6	57		22.0	59	
	Entrepreneur	38.3	60		13.2	53		21.8	55	
	Student	39.0	77		6.4	78		32.9	76	
	Home-maker	42.3	26		22.7	22		30.4	23	
Occupation	Technical, scientific	32.7	104	.108	7.8	102	**.008**	24.5	102	.289
	Social, health care	36.5	96	–	10.9	92	–	18.9	90	–
	Administrative, office	34.4	61		6.6	61		35.5	62	
	Commercial	31.7	63		11.7	60		26.2	61	
	Agriculture, forestry	51.5	97		20.5	88		25.8	93	
	Traffic, transportation	38.5	39		25.7	35		24.3	37	
	Industry	43.6	165		15.2	158		32.3	158	
	Service	41.3	75		23.6	72		31.5	73	
Opinion about the coverage of the wilderness areas in Finland	Too much	63.6	11	**.037**	45.5	11	**.003**	27.3	11	**.005**
	Enough	43.9	367	.087*	18.0	344	**.003***	34.5	348	**.006***
	Too few	37.7	300	***.041****	12.0	291	***.004****	23.0	291	***.004****
	I cannot say	31.1	90		10.6	85		21.1	90	
The length of respondent's typical wilderness visit	Day (2–10 hours)	45.2	230	.460	19.4	216	.614	40.4	218	**.014**
	Weekend (1–2 days)	49.5	105	*.615*	19.2	104	*.382*	28.7	101	***.005***
	Longer (3 days or more)	40.8	98		14.9	94		25.0	92	

Abbreviations and notes in the table:

M 1 (Management schedule 1): One half of the area consists of virgin forests the other half consists of young stands, no roads. M 2 (Management schedule 2): The whole area consists of young stands, no roads. M 3 (Management schedule 3): Similar to M 1, but roads are encountered after every kilometer's walk. %-column denotes the percents of the respondents that regard the area as wilderness if it is vast enough. The p-values are the following: normal font denotes the value of Pearson's chi-square test, italic font denotes the value of the test of Cochran's linear trend, bold denotes the statistically significant values using 5 % risk level, p-values with asterisks denotes the values when the class "I cannot say" has been excluden in the test. N denotes the number of cases.

6.1.4 A scenic evaluation of the forest stands

6.1.4.1 The reliability of scenic evaluations of forest stands using slides and nature visits

The scenic beauty, wilderness character and the forest's suitability for outdoor recreation of 51 forest stands were evaluated by the students of Rovaniemi Forest College in nature and using slides representing the stands. The median values of scenic evaluations that were made in nature and those based on the slide show correlate significantly. Spearman's rank order correlation coefficients are the following: scenic beauty 0.799 (80 mm lens) and 0.783 (45 mm lens), wilderness character 0.890 (80 mm lens) and 0.932 (45 mm lens), forests suitability for outdoor recreation 0.909 (80 mm lens) and 0.880 (45 mm lens). The p-values of all the correlation coefficients are 0.000.

If we, however, compare the evaluations that have been made in nature and on the slides, remarkable differences are found. Some persons have evaluated the scenic characteristics of certain forest stands in rather different ways in nature and in the pictures. Furthermore, the ease to evaluate the scenic factors of a stand has an influence on the difference between the evaluations in nature and on the slides. Although the squared r-values of the quadratic models in Figure 15 are rather low, some evidence is found that the biggest differences between the evaluation in nature and on the slides are found when the scenic value of a stand is evaluated to be near the center of the scenic scale. A similar pattern can be noticed in the evaluations of scenic beauty, wilderness character and a forest's suitability for outdoor recreation.

Some values of Cronbach's alphas describing the similarity of the scenic evaluations of the forest stands in nature and on the slides are very low. The distribution of Cronbach's alphas, however reveal that most of the forest stands have been evaluated rather similarly in nature and on the slides (Fig. 16). The mean and the median values of the alphas are rather high (Table 8). There are, however, some forest stands having very low, even negative, alpha values telling that the reliability model does not work.

Table 8 reveals that the six forest stands that consisted of tree-covered mires have been easiest to evaluate correctly on the slides: all the alphas are clearly positive and the maximum values are nearly as high as the maximum alphas of the mineral soil stands. The three stands of open mires have also been rather successfully evaluated on the slides, except the values of wilderness character on a slide that had been taken using the normal lens. The latter mentioned mire stand consisted of open mire with some scattered pines and snags. The two other open mire stands were entirely treeless.

All the median values of Cronbach's alphas of the mineral soil stands are higher than the mean values. This means that most of the stands have rather high alpha values telling that they are rather easy to evaluate reliably on the

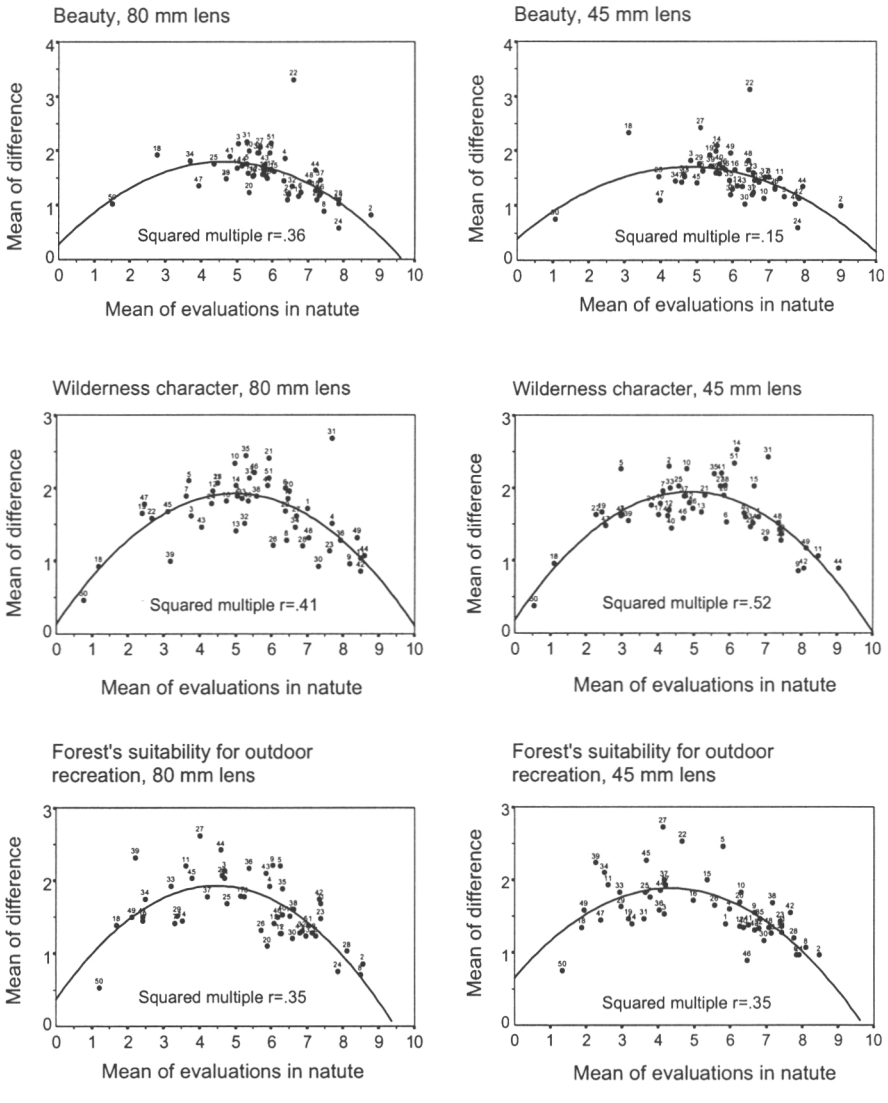


Fig. 15. The quadratic models describing the interrelationship between the differences of the evaluations of scenic beauty, wilderness character and a forest's suitability for outdoor recreation on slides that have been taken using different lenses and the evaluations in nature. The numbers in the pictures denote the stand numbers.

slide, but some stands looked rather different in nature and on the slide representing the stand. In particular some evaluations that have been made on the slides that were taken using the wide-angle lens were unsuccessful.

The Spearman's rank order correlation coefficients that have been calculated between the stand wise values of the Cronbach's alphas and the values

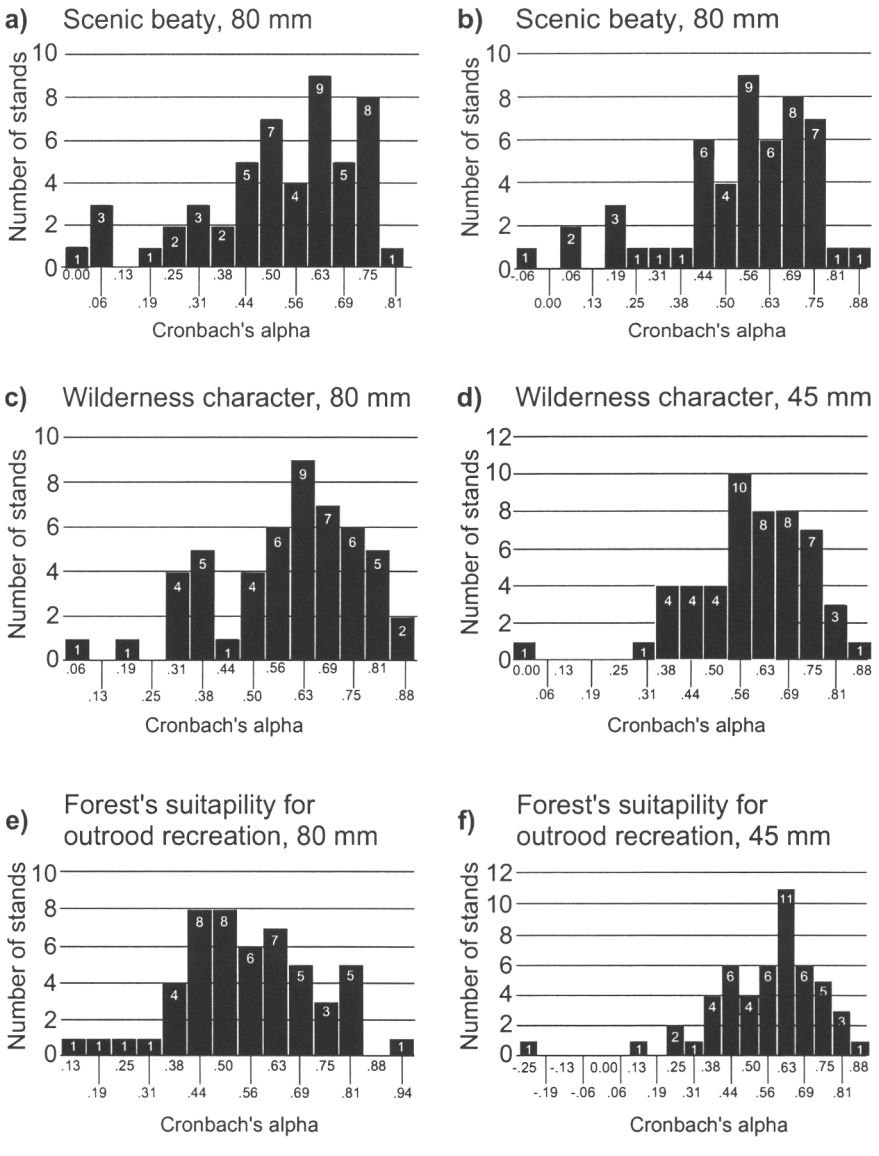


Fig. 16. The distribution of the Cronbach's alphas revealing the similarity of the scenic evaluations of the 51 forest stands. The evaluations have been made in nature and using the slides. The slides have been taken using normal (80 mm) and wide-angle (45 mm) lenses.

describing the forest characteristics reveal the characteristics that make it difficult to evaluate the scenic factors similarly in nature and on the slides. Tables 9 and 10 tell us that there are rather many characteristics correlating with the alpha values, but only a few ones if we omit the stands with the value of zero in the characteristic, telling the significant effect of the pres-

Table 8. Some descriptive statistics about the Cronbach's alphas of the forest stands that have been evaluated in nature and on the slides. The alpha values have been calculated between the evaluations of the three scenic factors in nature and the same evaluations that have been made on the slides taken with normal (80 mm) and wide-angle (45 mm) lenses.

Mineral soil stands, 42 stands

Scenic evaluation, the focal length of the lens	Mean	Standard deviation	Median	Minimum	Maximum	Range
Scenic beauty, 80 mm	.496	.206	.521	.009	.771	.762
Scenic beauty, 45 mm	.510	.209	.557	−.048	.804	.852
Wilderness character, 80 mm	.611	.165	.634	.285	.872	.587
Wilderness character, 45 mm	.581	.165	.587	−.024	.895	.919
Forest's suitability for outdoor recreation, 80 mm	.571	.167	.566	.113	.938	.825
Forest's suitability for outdoor recreation, 45 mm	.549	.208	.595	−.251	.900	1.151

Wooden mires (total volume >= 10 m^3/ha), 6 stands

Scenic evaluation, the focal length of the lens	Mean	Standard deviation	Median	Minimum	Maximum	Range
Scenic beauty, 80 mm	.590	.234	.676	.242	.816	.574
Scenic beauty, 45 mm	.679	.131	.662	.556	.856	.300
Wilderness character, 80 mm	.554	.205	.592	.176	.767	.591
Wilderness character, 45 mm	.619	.085	.643	.494	.702	.208
Forest's suitability for outdoor recreation, 80 mm	.467	.145	.456	.277	.640	.363
Forest's suitability for outdoor recreation, 45 mm	.528	.150	.542	.317	.731	.414

Open mires (total volume < 10 m^3/ha), 3 stands

Scenic evaluation, the focal length of the lens	Mean	Standard deviation	Median	Minimum	Maximum	Range
Scenic beauty, 80 mm	.645	.060	.613	.608	.515	.101
Scenic beauty, 45 mm	.662	.042	.678	.614	.693	.079
Wilderness character, 80 mm	.316	.270	.287	.062	.600	.538
Wilderness character, 45 mm	.630	.226	.733	.371	.786	.415
Forest's suitability for outdoor recreation, 80 mm	.548	.250	.483	.337	.824	.487
Forest's suitability for outdoor recreation, 45 mm	.709	.106	.710	.603	.815	.212

ence or absence of the scenic factor on the alpha. The negative correlation between the characteristics and the alphas denotes that if the characteristic is present (or increases its magnitude), the values of the alphas decrease remarkably while the positive values tell that the presence of the characteristic increases the alpha. This means that the presence or increasing magnitude of the characteristic makes it easier to evaluate the amenity value of the scenery reliably on the slide.

The median diameter of small deciduous stems and the number of dead stems are the most consistent features of the mineral soil stands which make it difficult to evaluate the scenic beauty similarly in nature and on the slides that have been taken using the normal (80 mm) lens. The same can be said about the decreasing number of pine stems when we are talking about the

evaluations of the wilderness character on the slides that have been taken using the normal lens, and the decreasing median length of deciduous trees and the number of tree stems when we are talking about the wilderness character evaluations on the slides of the wide angle (45 mm) lens. The growing coverage of slash as well as the growing values of the minimum and the median diameter as well as the decreasing number of tree stems make it difficult to evaluate a forest's suitability for outdoor recreation similarly in nature and on the slides.

Table 10, which has been calculated for the mire stands, reveals that the minimum diameter of living trees with a diameter at the height of 1.3 meters ($d_{1.3}$) more or equal than 7 cm has the only significant correlation coefficient with the Cronbach's alpha in the evaluation of wilderness character when the 0-stands have been omitted. It is remarkable that all the other correlation coefficients in the table between the forest characteristics and the Cronbach's alphas are negative. This means that when the characteristic is present, the reliability of the scenic evaluations decreases remarkably.

Table 11, however, reveals that the differences of the scenic evaluations between the evaluation of a forest stand in nature and on the slide are rather small in most cases: there are only few stands with the difference of more than two units on the scale from 0 to 10. The scores of scenic beauty and forest's suitability for outdoor recreation of four forest stands are strongly overestimated (the difference is 4 units) and the wilderness character of one stand is strongly underestimated in the picture compared with the estimations in nature (the difference is 3 units).

In general, it is difficult to say which of the lenses describes nature better and should be used in all the situations. The suitability of the lens depends on the forest stand and the property of the scenic evaluation. In the same stand, the wide-angle lens may be better in the evaluation of scenic beauty, but the normal lens may be better in the evaluation of wilderness character. This is the reason why the results of the certain lenses (normal or wide-angle lens) have been used in the computations of the values of the scenic evaluations of the certain forest stand.

6.1.4.2 The forest characteristics having an effect on the scenic experience

Many characteristics of the forest stands correlate with each other. Furthermore, most of the characteristics correlate with scenic beauty, wilderness character and a forest's suitability for outdoor recreation. Furthermore, scenic beauty correlates strongly with a forest's suitability for outdoor recreation as well (Table 12).

The results of the principal component analysis in Figure 17 reveals a rather high loadings of wilderness character on many of the principal components. The highest loadings are on the principal component that describes

Table 9. The forest characteristics of the mineral soil stands (total number is 45 stands) that have a statistically significant Spearman's rank order correlation coefficient with Cronbach's alpha using 5 % risk level. Alpha values have been calculated between the evaluations in nature and the evaluations of the slides taken with normal (80 mm) and wide angle (45 mm) lenses. Column n denotes the number of the forest stands that have a value other than zero.

Scenic evaluation/the focal length of the lens	Forest characteristics	All the stands		0-stands omitted		
		r	p	r	p	n
Scenic beauty, 80 mm	Number of pine stems, $d_{1.3}$>= 7 cm	–.329	.034	–.257	.163	31
	Volume of pine stems, $d_{1.3}$< 7 cm	–.355	.021	–.362	.117	20
	Total volume of pine stems	–.394	.031	–.075	.680	33
	Median diameter of deciduous stems, $d_{1.3}$< 7 cm	*.309*	*.046*	*.400*	*.019*	*34*
	Number of fallen dead stems	.353	.022	.195	.373	23
	Median length of fallen dead stems	.334	.031	.157	.474	23
	Total number of dead stems	*.355*	*.021*	*.460*	*.010*	*30*
Scenic beauty, 45 mm	Coverage of willows	.322	.037	–.106	.744	12
	Number of stumps	–.372	.015	–.253	.156	33
	Number of fallen dead stems	.322	.038	.263	.226	23
	Median length of fallen dead stems	.329	.033	.288	.183	23
	Total volume of fallen dead stems	.367	.017	.406	.054	23
Wilderness character, 80 mm	*Number of pine stems, $d_{1.3}$ >= 7 cm*	*.343*	*.026*	*.413*	*.021*	*31*
Wilderness character, 45 mm	Coverage of slash	–.407	.008	–.322	.131	22
	Coverage of willows	.357	.020	–.453	.139	12
	Number of stumps	–.356	.021	.040	.824	33
	Median diameter of pine stems, $d_{1.3}$ >= 7 cm	–.324	.037	–.101	.590	31
	Median length of pine stems, $d_{1.3}$ >= 7 cm	–.337	.029	–.114	.543	31
	Median length of deciduous stems,$d_{1.3}$ < 7 cm	*.431*	*.004*	*.396*	*.020*	*34*
	Volume of deciduous stems, $d_{1.3}$ < 7 cm	.317	.041	.221	.210	34
	Number of standing tree stems	*.391*	*.010*	*.517*	*.001*	*40*
	Total number of tree stems	*.412*	*.006*	*.545*	*.000*	*40*
Forest's suitability for outdoor recreation, 80 mm	*Coverage of slash*	*–.308*	*.047*	*–.451*	*.035*	*22*

Table continues on the next page

Scenic evaluation/the focal length of the lens	Forest characteristics	All the stands		0-stands omitted		
		r	p	r	p	n
Forest's suitability for outdoor recreation, 45 mm	*Coverage of slash*	*–.389*	*.011*	*–.503*	*.017*	*22*
	Number of stumps	–.387	.011	–.241	.177	33
	Minimum diameter of pine stems, $d_{1.3}$ >= 7 cm	–.454	.003	–.383	.033	31
	Median diameter of pine stems, $d_{1.3}$ >= 7 cm					
	Maximum diameter of pine stems, $d_{1.3}$ >= 7 cm	–.370	.016	–.223	.228	31
	Median length of pine stems, $d_{1.3}$ >= 7 cm	–.417	.006	–.317	.082	31
	Maximum length of pine stems, $d_{1.3}$ >= 7 cm	–.322	.037	–.124	.506	31
	Median age of pine trees, $d_{1.3}$ >=7 cm	–.348	.024	–.177	.342	31
	Maximum age of pine trees, $d_{1.3}$ >=7 cm	–.385	.012	–.257	.170	31
	Minimum diameter of deciduous stems, $d_{1.3}$ >= 7 cm	–.319	.040	–.235	.204	31
	Maximum length of deciduous stems, $d_{1.3}$ >= 7 cm	–.314	.043	–.256	.164	31
	Minimum diameter of living tree stems, $d_{1.3}$ >= 7 cm	*–.457*	*.002*	*–.426*	*.010*	*36*
	Median diameter of living tree stems, $d_{1.3}$ >= 7 cm	–.371	.016	–.307	.069	36
	Maximum diameter of living tree stems, $d_{1.3}$ >= 7 cm	–.307	.048	–.218	.203	36
	Median length of living tree stems, $d_{1.3}$ >= 7 cm	–.342	.027	–.265	.119	36
	Minimum diameter of tree stems, $d_{1.3}$ >= 7 cm	*–.411*	*.007*	*–.362*	*.030*	*36*
	Number of standing tree stems	*.329*	*.033*	*.472*	*.002*	*40*
	Total number of tree stems	*.327*	*.034*	*.472*	*.002*	*40*
	Median diameter of tree stems	*–.378*	*.014*	*–.315*	*.047*	*40*
	Maximum diameter of tree stems	–.313	.044	–.242	.132	40
	Median length of tree stems	–.348	.024	–.283	.076	40
	Maximum length of tree stems	–.310	.046	–.239	.138	40

Italic font indicates that results are significant when 0-stands have been omitted.

Table 10. The forest characteristics of the mire stands (total number is 9 stands) that have a statistically significant Spearman's rank order correlation coefficient with Cronbach's alpha using 5 % risk level. Alpha values have been calculated between the evaluations in nature and the evaluations of the slides taken with normal (80 mm) and wide angle (45 mm) lenses. Column n denotes the number of the forest stands that have the other value than zero.

Scenic evaluation/the focal length of the lens	**Forest characteristics**	**All the stands**		**0-stands omitted**		
		r	**p**	**r**	**p**	**n**
Scenic beauty, 45 mm	Number of stumps	–.822	.007	1.000	–	3
Wilderness character, 45 mm	*Minimum diameter of living tree stems, $d_{1.3}$ >= 7 cm*	*–.710*	*.032*	*–.766*	*.045*	*7*
	Number of standing dead tree stems, $d_{1.3}$ >= 7 cm	–.714	.031	–.825	.085	5
	Total volume of standing dead tree stems,$d_{1.3}$ >= 7 cm	–.696	.037	–.418	.483	5
	Median age of living trees	–.762	.017	–.579	.174	7
	Maximum age of living trees	–.762	.017	–.399	.376	7
	Length of tree stems, $d_{1.3}$ < 7 cm	–.672	.047	–.113	.810	7
Forest's suitability for outdoor recreation, 80 mm	Minimum diameter of pine stems, $d_{1.3}$ >= 7 cm	–.677	.045	–.210	.735	5
	Median diameter of pine stems, $d_{1.3}$ >= 7 cm	–.714	.031	–.675	.211	5
	Maximum diameter of pine stems, $d_{1.3}$ >= 7 cm	–.818	.007	–.706	.183	5
	Average volume of pine stem, $d_{1.3}$ >= 7 cm	–.714	.031	–.396	.510	5
	Median age of pine trees, $d_{1.3}$ >=7 cm	–.836	.005	–.861	.061	5
	Maximum age of pine trees, $d_{1.3}$ >= 7 cm	–.853	.003	–.789	.112	5
	Median age of living trees	–.703	.035	–.669	.100	7
	Maximum age of living trees	–.670	.049	–.586	.167	7
	Median length of pine trees, $d_{1.3}$ < 7cm	–.769	.015	–.325	.594	5
	Median diameter of pine trees, $d_{1.3}$ < 7 cm	–.853	.003	–.744	.149	5

Table 11. The differences in the median values of the scenic evaluations of the 51 forest stands that were evaluated in nature and on the slides by the 30 forest college students.

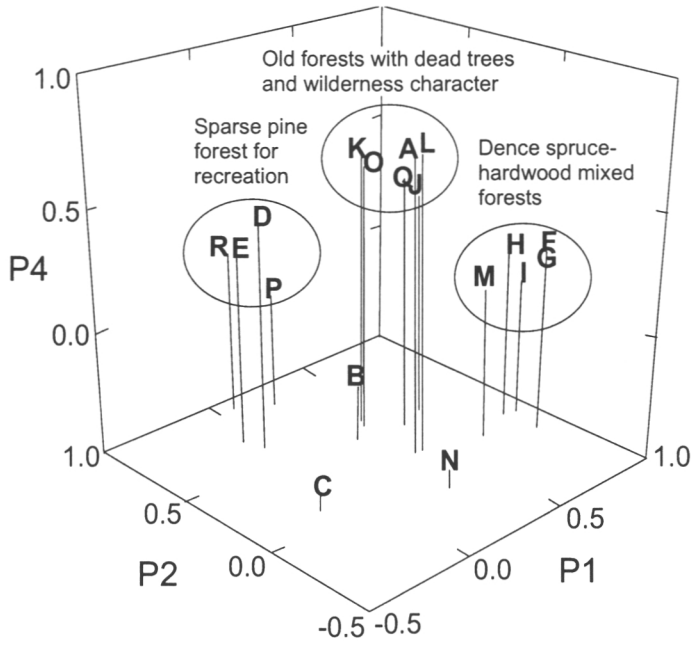
Difference between the evaluations in nature and on the slides	Number of forest stands						
	Scenic beauty, 80 mm lens	Scenic beauty, 45 mm lens	Wilderness character, 80 mm lens	Wilderness character, 45 mm lens	Forest's suitability for outdoor recreation, 80 mm lens	Forest's suitability for outdoor recreation, 45 mm lens	Total number of a certain difference
–4.0	1	1			1	1	4
–3.5							
–3.0			2				2
–2.5				1			1
–2.0	1		6	1	1		9
–1.5		1	2	4		1	8
–1.0	2	1	15	8	2	1	28
–0.5	2	3	3	4	2	3	17
0.0	**22**	**21**	**14**	**16**	**22**	**21**	**116**
0.5	1	2		4	1	2	10
1.0	19	15	8	11	19	15	87
1.5		4				4	8
2.0	3	3		1	3	3	13
2.5				1			1
3.0			1				1

the high age of trees, the high volume of tree stems, the high amount of epiphytic lichens and the high volume of dead tree stems. Furthermore, wilderness character has a high loading on the spruce-hardwood mixed forest principal component. Scenic beauty and a forest's suitability for outdoor recreation have their highest loadings on the principal component that describes pine forests. The number of stumps and the coverage of slash have strong negative loadings on principal component number three, the component of rather high positive loading on wilderness character. Stumps and slash have a negative correlation with the little trees ($d_{1.3} < 7$ cm). A rather high positive loading of wilderness character reveals that slash and stumps impair wilderness experience remarkably, but dense undergrowth of small trees may even promote the experience. The third principal component can be called the principal component of forest management activities. These management activities do not have not a very strong effect on scenic beauty and a forest's suitability for outdoor recreation, at least when there are not very many stumps and slash in the forest or the undergrowth is not very dense.

Another way to study the effects of the forest characteristics on scenic evaluations is to calculate the principal component loadings of the forest characteristics and the component scores of these principal components for every forest stand and, after that, form the correlation matrix between the component scores and the values of the scenic evaluations. Table 13 describes

Table 12. Spearman's rank order correlation matrix describing the interrelationship between some of the most important forest characteristics and the evaluated scenic factors. The significance levels are: * <= 0.050, ** <= 0.010 (two tailed significance).

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Epiphytic lichens (classified)															
2	Coverage of slash (% of the ground)	.002														
3	Number of stumps/ha	−.431 **	.547 **													
4	Maximum diameter of pines (cm)	.309 *	.363 *	.180												
5	Total volume of pine stems (m^3/ha)	.137	.161	.114	.768 **											
6	Maximum diameter of spruces (cm)	.462 **	−.090	−.321 *	.062	.015										
7	Total volume of spruce stems (m^3/ha)	.464 **	−.169	−.394 **	−.049	−.042	.964 **									
8	Maximum diameter of deciduous trees (cm)	.463 **	.060	−.157	.221	.095	.770 **	.727 **								
9	Total volume of deciduous stems (m^3/ha)	.304 *	−.205	−.358 *	−.003	.008	.775 **	.821 **	.807 **							
10	Total volume of living tree stems (m^3/ha)	.536 **	−.087	−.326 *	.314 *	.495 **	.648 **	.664 **	.699 **	.703 **						
11	Median age of trees (average age of median trees of pines, spruces and deciduous trees)	.675 **	.183	−.176	.633 **	.383 **	.388 **	.358 *	.443 **	.311 *	.547 **					
12	Total volume of standing dead trees (m^3/ha)	.610 **	−.085	−.362 *	.404 **	.273	.511 **	.467 **	.520 **	.402 **	.580 **	.604 **				
13	Number of tree stems, d1.3<7cm	.240	−.272	−.431 **	−.026	.154	.596 **	.649 **	.476 **	.666 **	.610 **	.148	.294			
14	Number of tree stems, d1.3>=7 cm	−.126	−.406 **	−.298 *	−.384 **	−.301 *	.114	.161	−.012	.230	−.057	−.168	−.286	.224		
15	Total volume of fallen dead stems (m^3/ha)	.479 **	−.143	−.333 *	.306 *	.296 *	.361 *	.385 **	.254	.298	.520 **	.438 **	.565 **	.340 *	−.269	
16	Scenic beauty	.256	−.022	−.061	.303 *	.341 *	.210	.258	.322 *	.294	.479 **	.325 *	.220	.115	−.135	.237
17	Wilderness character	.597 **	−.322 *	−.540 *	.243	.265	.641 **	.652 **	.488 **	.597 **	.730 **	.619 **	.598 **	.549 **	.074	.574 **
18	Forests's suitability for outdoor recreation	.352 *	.154	−.018	.557 **	.546 **	.113	.101	.253	.133	.469 **	.480	.261	.038	−.275	.347



LABEL	VARIABLE	COMPONENT LOADINGS OF PRINCIPAL COMPONENTS (P)			
		P 1 (26.6 %)	P 2 (16.3 %)	P 3 (13.0 %)	P 4 (19.5 %)
A	Epiphytic lichens (classified)	.301	.104	.056	**.754**
B	Coverage of slash (% of the ground)	-.027	.045	**-.870**	-.018
C	Number of stumps/hectar	-.202	.077	**-.747**	-.418
D	Diameter of maximum pine stem (cm)	-.053	**.560**	-.462	.475
E	Total volume of pine stems (m³/ha)	-.051	**.698**	-.223	.286
F	Diameter of maximum spruce stem (cm)	**.895**	-.025	.048	.278
G	Total volume of spruce stems (m³/ha)	**.902**	-.020	.164	.242
H	Diameter of maximum deciduous stem (cm)	**.862**	.127	-.174	.218
I	Total volume of deciduous stems (m³/ha)	**.907**	.096	.177	.087
J	Total volume of living tree stems (m³/ha)	**.668**	.452	.090	.400
K	Age of median living tree (years)	.266	.331	-.186	**.697**
L	Total volume of standing dead tree stems (m³/ha)	.340	.095	-.008	**.791**
M	Number of tree stems ($d_{1.3}$ >= 7 cm)/ha	**.675**	.072	.343	.122
N	Number of tree stems ($d_{1.3}$ < 7 cm)/ha	.225	-.160	**.557**	-.396
O	Total volume of fallen dead tree stems (m³/ha)	.170	.216	.174	**.700**
P	Scenic beauty	.237	**.854**	.089	.006
Q	Wilderness character	***.512***	.367	*.391*	***.537***
R	Forest's suitability for outdoor recreation	.067	***.906***	-.069	.211

Fig. 17. The loadings of the first 4 principal components (P1–P4) of some first characteristics and the scenic evaluations of the mineral soil forest stands. The variance explained by the principal components is printed in parenthesis. The total variance explained by the principal components is 75.4 %. The analysis is based on Spearman's rank order correlation matrix.

the principal component loadings of the forest characteristics. The first principal component can be called the principal component of spruce-hardwood deciduous forests, the second principal component as the principal component of virgin forests, the third principal component as the principal component of forestry practices and the fourth principal component as the principal component of pine forests.

The values of the scenic evaluations of wilderness character have a significant positive correlation with the component scores of the principal component describing spruce-hardwood forests (Table 14). The component scores of the principal component of the virgin forests correlate with the values of wilderness character and a forest's suitability for outdoor recreation. Moreover, the scores of the principal component describing the number of stumps and the coverage of slash correlate with the values of wilderness character. The component scores of the third principal component decrease with an increasing amount of stumps and coverage of slash. Because the correlation coefficient is positive, this means that wilderness character decreases with an increasing amount of stumps and coverage of slash. The value of the scores of the fourth principal component increase with the increasing volume and diameter of pine trunks. The positive significant correlation coefficient with the values of scenic beauty and a forest's suitability for outdoor recreation means that coarse pine forests are considered to be a beautiful and attractive environment for outdoor recreation.

Table 13. The Varimax-rotated principal component loadings of some forest characteristics. P1–P4 denote the principal components 1–4. The percent values in the parenthesis denote the percent of variance explained by the principal component. The total variance explained by the principal components is 78.3 %.

Variable	Component loadings of principal components (p)			
	P 1 (29.9 %)	P 2 (20.7 %)	P 3 (14.2 %)	P 4 (13.5 %)
Epiphytic lichens (classified)	.278	**.830**	.034	–.019
Coverage of slash (% of the ground)	–.022	.005	**–.872**	.086
Number of stumps/hectar	–.184	–.425	**–.749**	.142
Diameter of maximum pine stem (cm)	–.007	.389	–.371	**.740**
Total volume of pine stems (m^3/ha)	.020	.134	–.088	**.955**
Diameter of maximum spruce stem (cm)	**.884**	.294	.048	–.073
Total volume of spruce stems (m^3/ha)	**.888**	.278	.154	–.166
Diameter of maximum deciduous stem (cm)	**.858**	.275	-.171	.035
Total volume of deciduous stems (m^3/ha)	**.909**	.107	.183	.020
Total volume of living tree stems (m^3/ha)	**.694**	.376	.141	.446
Age of median living tree (years)	.272	**.710**	–.187	.304
Total volume of standing dead tree stems (m^3/ha)	.329	**.770**	.050	.180
Number of tree stems (d1.3 >= cm)/ha	**.698**	.004	.436	.238
Number of tree stems (d1.3 < 7 cm)/ha	.229	–.402	**.521**	–.227
Total volume of fallen dead tree stems (m^3/ha)	.175	**.694**	.243	.300

Table 14. Spearman's rank order correlation coefficients between the principal component scores of the four principal components and the scenic evaluations of the mineral soil forest stands (45 stands). The loadings of the principal components have been presented in Table 13. The significance levels are: * means a significance of <= 0.050 and ** means a significance of <= 0.010.

The scenic evaluation	Principal component (P)			
	P1	P2	P3	P4
Scenic beauty	.182	.233	–.012	.298*
Wilderness character	.503**	.362*	.318*	.271
Forest's suitability for outdoor recreation	.035	.394	–.155	.462**

The use of discriminant analysis is an attempt to find the best linear function to classify the forest stands as median, under median and over median stands based on the values of the scenic evaluations of the three scenic factors. It is important to find out what are the right characteristics of the forest stand to support the classification. The stepwise linear discriminant analysis was used to do that (see Chapter Four for more details).

The results of the discriminant analysis reveal that the basal area of trees, the median age of the trees (the average of the median ages of all the tree species) and the maximum diameter of dead tree trunks discriminate best the forest stands from each other by their wilderness character. The classification of the character is the following: strong wilderness character (with a value over the median, Group 1 in Fig. 18), medium wilderness character (Group 2) and weak wilderness character (Group 3). The efficiency of the linear discriminant function is 80 %. It means that 80 % of the forest stands have been classified into the right class. The canonical correlation coefficient of the first discriminant function is 0.800 and the correlation of the second function 0.472. Moreover, the multivariate tests produce statistically significant results (Table 15).

Tables 16 and 17 reveal that the first discriminant function classifies the forest stands based on the basal area of tree trunks and the median age of trees. The basal area is more important in the function. The other discriminant function classifies the forest stands mainly based on the maximum diameter of standing dead tree stems. The discrimination between the forest stands including strong or weak wilderness character is rather successful. Most of the wrong classifications occur when the wilderness character of a forest stand has been evaluated as the median value of all the stands (Fig 18).

Thus, according to the evaluation of multi-variable analysis, it is apparent that a wilderness forest stand on mineral soil includes dead tree trunks. Spruce-hardwood forests are experienced as wilderness forests more often than pine forests. The latter mentioned forest stands have to be rather old before they are considered as wilderness forests. The best median value in

the wilderness evaluations of the spruce and pine forests is 8. The median ages of those pine stands range from 168 to 232 years and the median ages of the spruce stands from 94 to 129 years. Two forest stands that have been dominated by hardwoods get the median value of 8 in the wilderness evaluations as well. The ages of these stands range from 96 to 127 years. The spruce-hardwood forests are not considered to be as beautiful as the pine forests. Furthermore, they are not considered to be as good environments for outdoor recreation as compared to the pine forests. If a forest stand, however, consists of white birch, it is beautiful and suitable for outdoor recreation but it is not a very wilderness-like forest landscape. The median scores of evaluations of rather pure 60 year-old white birch stands are the following: scenic beauty 8, wilderness character 5 and suitability for outdoor recreation 8.

The median scores of the scenic evaluations in Table 18 reveal that mires are considered as wilderness-like environments. The number of trees and the volume of tree stock do not have a very strong effect on the visitors' wilderness experience. Open mires are considered roughly as wilderness-like as the tree-covered mires covered with old spruces. Some old scattered pines in the scenery may increase the wilderness character of an open mire a little. On the other hand, ditches in the scenery negatively influence the

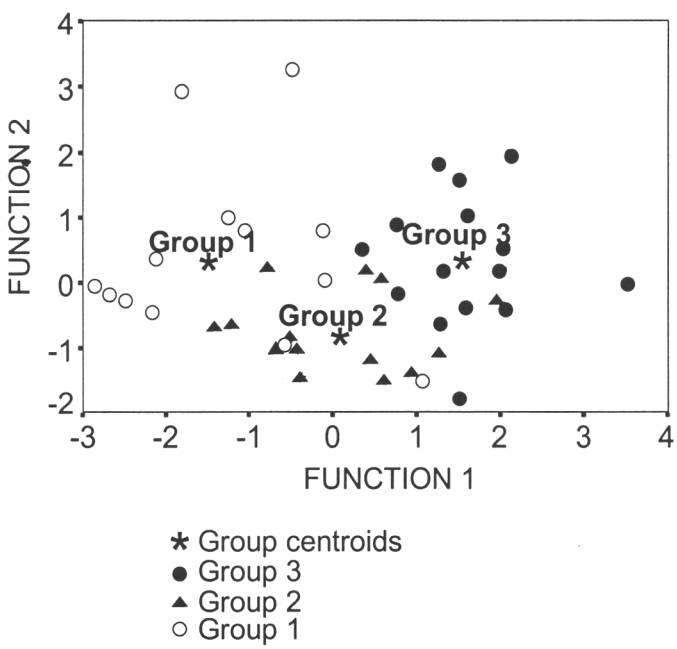


Fig. 18. The classification of the forest stands including wilderness character of over median value of all stands (Group 3), median value of the stands (Group 2) and under median value of the stands. The analysis that has been used is linear discriminant analysis. Eighty percent of the stands have been classified correctly.

wilderness experience, but they do not spoil the wilderness landscape completely. In general, besides their strong wilderness character, mires are considered to be rather beautiful landscapes, but not very suitable for outdoor recreation in the summertime.

Figures 19–21 reveal that the scenic evaluations of the scenic characteristics between different groups of the respondents are rather similar from one forest stand to another. In some stands, however, the median values of the scores differ remarkably. In general, the differences in the medians of the scores between the groups of the respondents are one or two points, but some bigger differences are found as well, especially between some occupation groups. Only those differences have been published where the differences between the groups of the respondents differ remarkably in some of the three scenic evaluations considering all the stands. Statistically significant differences are found only in the evaluations of wilderness character

Table 15. Some statistical tests of the linear discriminant function for classification of the mineral soil forest stands according to their wilderness character.

The test	The value of the test	The significance of the test
Wilk's lambda	.279	.000
Pillai	.863	.000
Hotelling-Lawley	2.070	.000

Table 16. The canonical correlation coefficients between the discriminant variables and the canonical discriminant functions concerning wilderness character.

Variable	Function	
	Function 1	Function 2
The basal area of trees	.829	–.011
The median age of trees	.487	–.089
The maximum diameter of standing dead trees	.361	–.919

Table 17. The standardized coefficients of the dicriminant functions concerning wilderness character.

Variable	Function	
	Function 1	Function 2
The basal area of trees	.892	.269
The median age of trees	.586	.381
The maximum diameter of standing dead trees	–.067	–1.129

between age groups, in the evaluations of scenic beauty and wilderness character between education groups, and in the evaluations of a forest's suitability for outdoor recreation between occupation groups using Kruskal-Wallis one-way analysis of variance, Mann-Whitney's U-test or parametric one-way analysis of variance. The results of the latter-mentioned test have been published only if the variances between different groups are similar to each other using Levene's test. Because of the interpretation of the scale, the results of Kruskal-Wallis' test may be more suitable in analyzing the differences.

The younger respondents tend to be more exact than the older ones when they evaluate the wilderness character of a forest stand (Table 19). In general, the youngest group of the respondents gave the lowest values in the wilderness evaluations and the oldest group the highest. On the other hand, high school graduate respondents gave a little bit higher scores than those respondents who have lower education. In the evaluations of scenic beauty, it is evident that the respondents who work in agriculture, forestry or industry have given slightly lower values than the respondents who work in other occupations have. Nearly the same can be said about the differences in the evaluations of wilderness

Table 18. Description of the evaluated mires and the scores of evaluations of scenic beauty, wilderness character and the mires' suitability for outdoor recreation (medians of the scores). Vol. in Forest cover column means volume of tree stock.

Forest stand	Mire (type)	Forest cover	Ditches	Scenic beauty	Wildern. character	Suit. for recreation
44	Low-sedge fen	Old scattered dwarf pines, vol. 5 m³/ha	No	8	9	6
11	Tall-sedge fen	Treeless	No	7	8	4
36	*Carex globularis* spruce swamp	Rather old dwarf spruces, vol. 16 m³/ha	No	6	8	5
49	Flark fen	Treeless	No	6	8	2
31	Herb-rich hardwood-spruce swamp	Big spruces, quite many of them dead, vol. 144 m³/ha	Exist, not visible	5	8	4
33	Eutrophic *Sphagnum fuscum* rich pine fen	Old scattered dwarf pines, vol. 12 m³/ha	Exist, visible	6	7	4
17	Tall-sedge pine fen	Quite young and dense pine forest, vol. 73 m³/ha	Exist, not visible	6	6	6
37	Herb-rich sedge hardwood-spruce fen	Quite young and dense birch forest, vol. 64 m³/ha	Exist, not visible	7	5	4
47	Herb-rich sedge birch-pine fen	Dense, quite young pine-birch forest, vol. 28 m³/ha	Exist, visible	3	4	2
Median of all mire stands				**6**	**8**	**4**

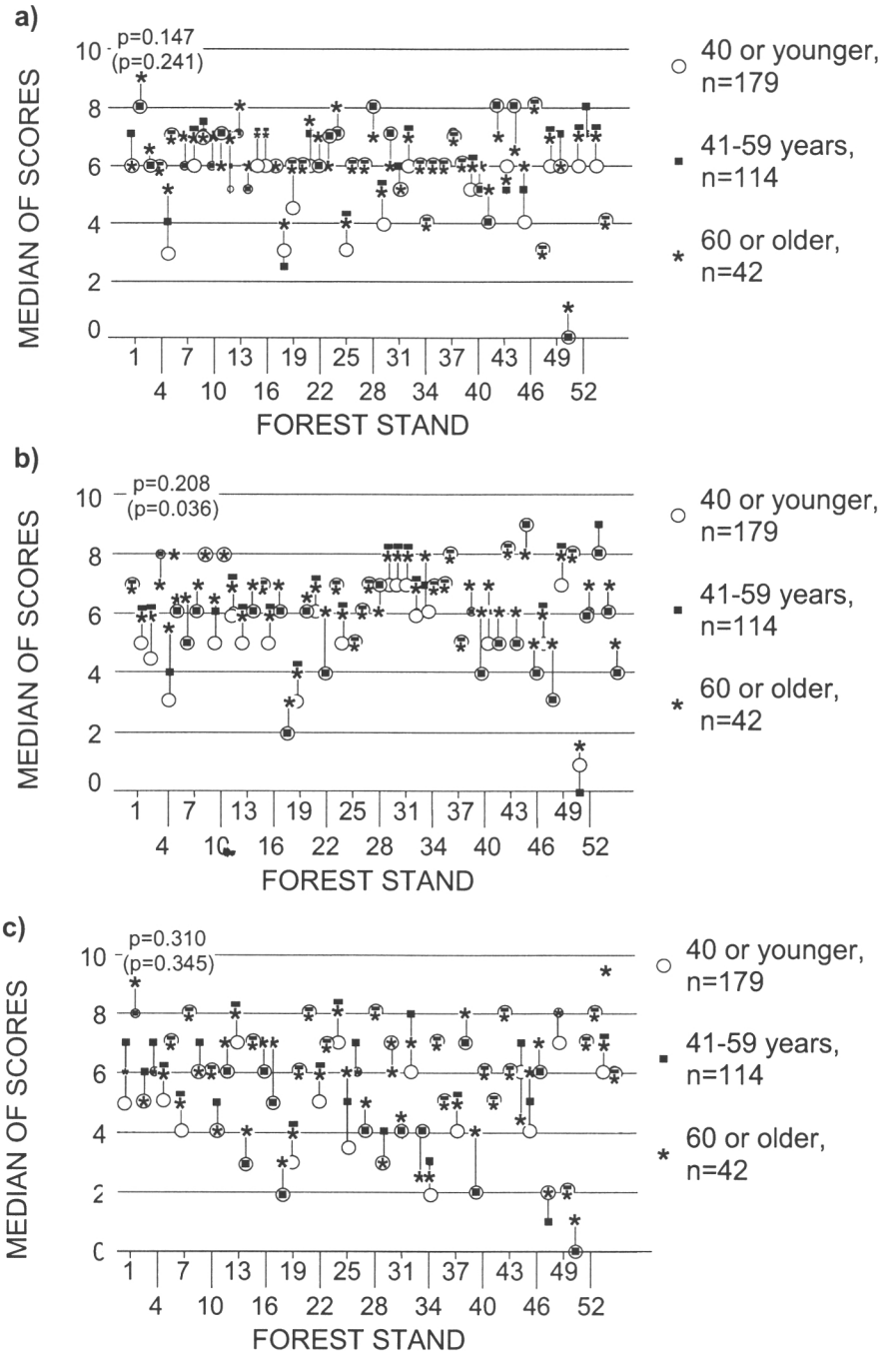


Fig. 19. The differences in the evaluations of scenic beauty (a), wilderness character (b), and forest's suitability for outdoor recreation (c) between different age classes. The p-value of Mann-Whitney's U-test or Kruskal-Wallis' one-way analysis of variance is expressed without parentheses and p-value of oneway analysis of variance in parentheses.

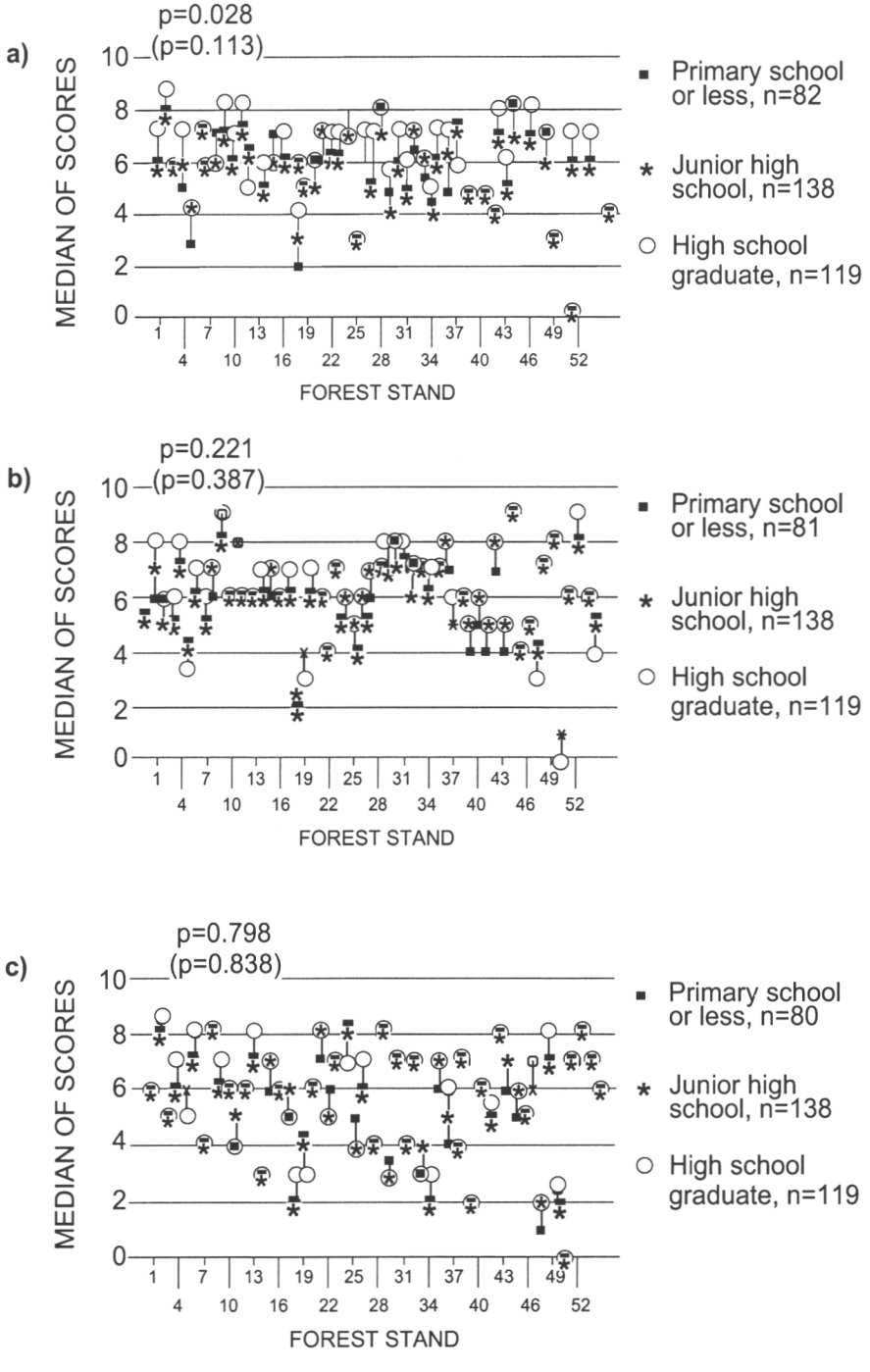


Fig. 20. The differences in the evaluations of scenic beauty (a), wilderness character (b), and forest's suitability for outdoor recreation (c) between different education classes. The p-value of Mann-Whitney's U-test or Kurskal-Wallis' one-way analysis of variance is expressed without parentheses and the p-value of oneway analysis of variance in parentheses.

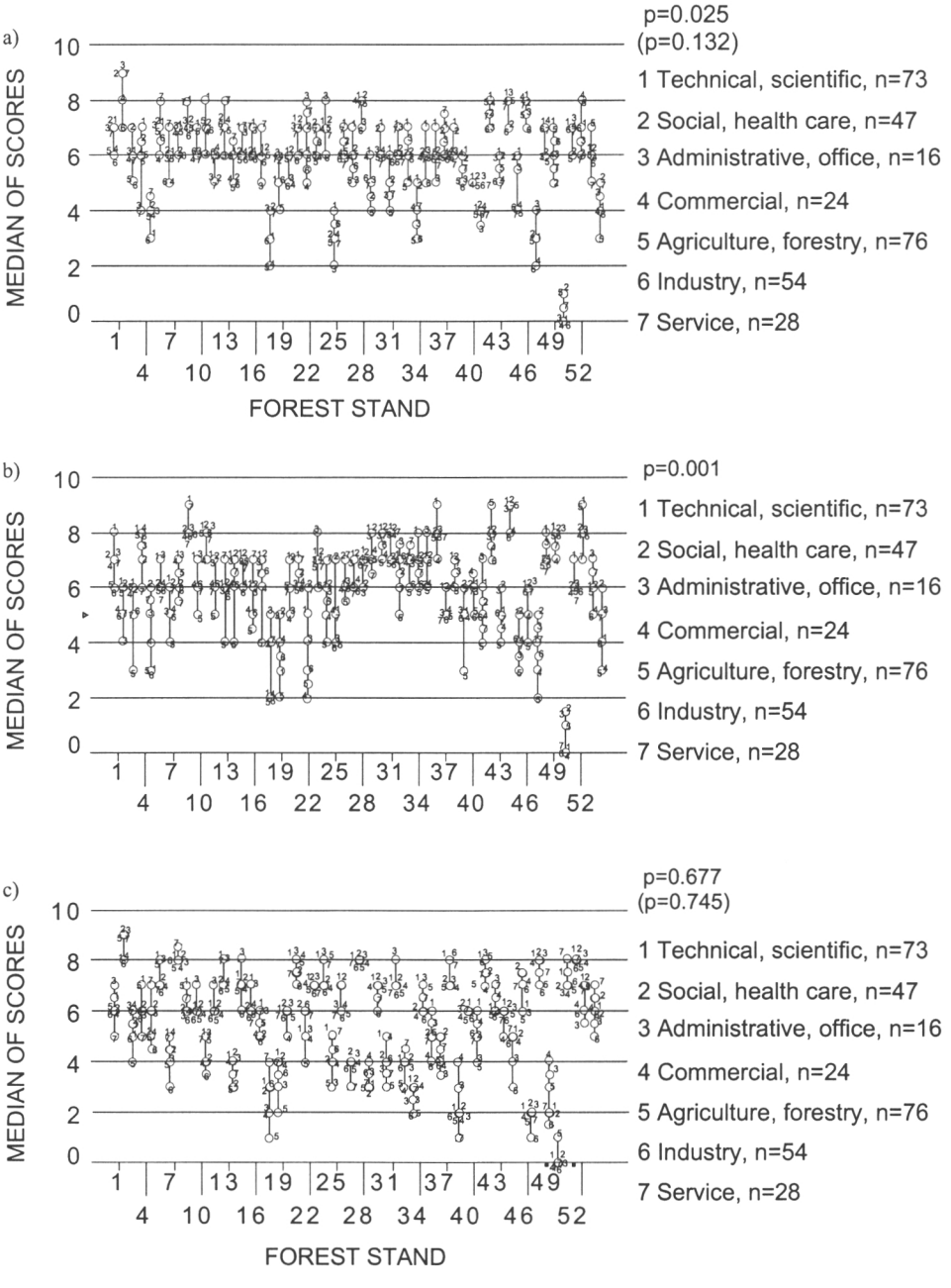


Fig. 21. The differences in the evaluations of scenic beauty (a), wilderness character (b), and forest's suitability for outdoor recreation (c) between different occupation classes. The p-value of Mann-Whitney's U-test or Kruskal-Wallis' one-way analysis of variance is expressed without parentheses and the p-value of oneway analysis of variance in the parentheses.

Table 19. The differences in the certain scenic evaluations between different groups of the respondents of data set 2. The differences have been described using some average values of all the obeservations (all the respondents and all the forest stands). Only those scenic factors and respondent groups have been included in the table where Kruskal-Wallis' one way analysis of variance, Mann-Whitney's U-test or parametric one way analysis of variance revealed statistically significant differnces (see Figures 19–21). The variable, occupation, does not include the groups traffic and transportation as well as homemakers because of the sparse observations in those groups. CI represents confidence limits.

Scenic evaluation	Grouping variable	Group	Median	Mean	Standar deviation	Standard error	95 % CI for mean	Number of evaluations
Wilderness character	Age	40 years or less	6.00	5.60	2.65	0.03	5.42–5.65	9731
		41–59 years	6.00	5.92	2.57	0.03	5.85–5.98	6340
		60 years or more	7.00	6.16	2.48	0.05	6.06–6.26	2451
Scenic beauty	Education	Prinary school	6.00	5.51	2.51	0.04	5.44–5.59	4564
		Junior high school	6.00	5.51	2.41	0.03	5.46–5.56	7596
		High school graduate	6.00	5.94	2.37	0.03	5.88–6.00	6517
Scenic beauty	Occupation	Technical, scientific	6.00	6.00	2.41	0.04	5.92–6.07	4048
		Social, public health	6.00	5.78	2.30	0.05	5.69–5.87	2591
		Administrative, office	6.00	5.70	2.31	0.08	5.55–5.85	893
		Commercial	6.00	5.58	2.32	0.06	5.46–5.70	1346
		Agriculture, forestry	6.00	5.47	2.46	0.04	5.39–5.41	4200
		Industry	6.00	5.37	2.42	0.05	5.29–5-46	2915
		Service	6.00	5.77	2.67	0.07	5.63–5.90	1605
Wilderness character	Occupation	Technical, scientific	7.00	6.15	2.60	0.04	6.07–6.23	4048
		Social, public health	7.00	6.16	2.31	0.05	6.07–6.25	2589
		Administrative, office	7.00	6.13	2.51	0.08	5.96–6.29	892
		Commercial	6.00	5.64	2.49	0.07	5.50–7.77	1345
		Agriculture, forestry	6.00	5.31	2.78	0.04	5.23–5.39	4194
		Industry	6.00	5.58	2.55	0.05	5.48–5.67	2916
		Service	6.00	5.86	2.80	0.07	5.73–6.00	1603

character between occupation groups. In addition, it is remarkable that the respondents who work in agriculture or forestry gave the lowest values in the evaluations of wilderness character of the forest stands. Because of the small number of respondents in the group of traffic or transportation, the members of this group were excluded in the analysis.

6.1.5 The effect of some constructions and other scenic features of the landscape on wilderness experience

The respondents were also asked to evaluate the effect of some scenic characteristics, some constructions and management practices as well as one situation encountered (to be lost) in their wilderness experience. There was one yes/no question in Data Set 1 about the constructions (suitable/not suitable for wilderness) and two questions in Data Set 2 where the effects have been evaluated using a five-point Likert scale (see Appendix 1 and 2; question 13 in Data Set 1, questions 29 and 30 in Data Set 2).

The results of the study reveal that open huts and narrow wooden paths crossing mires are the most acceptable constructions in wilderness areas. Ready-made campsites with fireplaces are not very popular according to the results of Data Set 1. Furthermore, to close a hut and rent it out for visitors is supported only by a minority of the respondents in the wilderness context. Slalom tracks and "wilderness bars" are the worst (Fig 22).

Figure 23 reveals that there are some respondents who do not want any constructions or other management practices that have been mentioned in question 29 in Data Set 2 to be built or done in wilderness. On the other hand, ninety percent or more of the respondents do not set themselves against signs, constructed campsites, rubbish collection, fish plantations using natural species as well as such traditional constructions like open huts for common use and wooden paths crossing mires. If restaurant services (coffee, snacks) are sold in an old type of Saami hut, it divides the opinions of the respondents. The same can be said about fish plantations using rainbow trout and closed huts for rent. About third of the respondents do not accept these things.

From the cluster analysis of question number 29 in Data Set 2 (Fig. 24), it appears that there are two main groups of constructions and management practices. One group is the group of generally accepted things such as campsites and paths with rubbish collection as well as open huts for common use and fish plantations using natural species. Another group consists of very modern things, such as skiing tracks managed by machines, restaurant services, closed huts for rent and fish plantations using rainbow trout. The first six constructions mentioned in the upper part of the figure form a rather clear cluster with a re-scaled distance from 1 to 7 distance units. This cluster

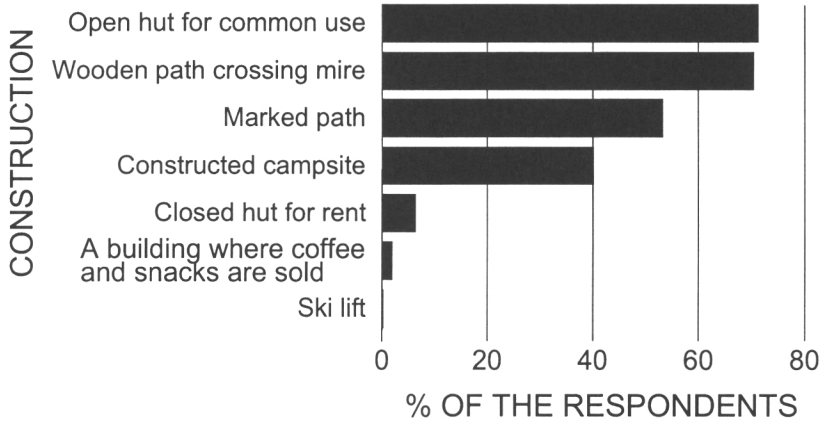


Fig. 22. The appropriateness of some construction in wilderness according to the respondents of Data Set 1 (n=880). The percent indicates how many percent of the respondents accept the construction in wilderness areas.

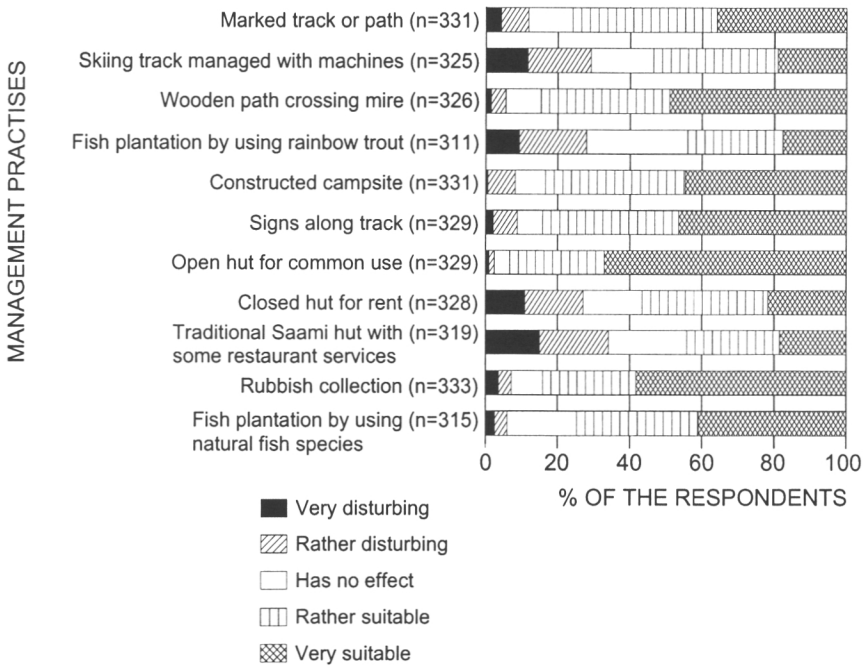


Fig. 23. The distributions of the appropriateness of some management practices in the wilderness areas in Data Set 2.

indicates the typical constructions in our national parks. Moreover, ski tracks that are managed with machines and Saami huts with some commercial coffee and snack services form a cluster with a distance of about sixteen units. This cluster can be named as the cluster of constructions that are used in some recreation areas. The respondents' attitudes toward these constructions and closed huts for rent appear to be rather similar.

In Figure 25, it is noticeable that although they form a minority of the respondents, there are some respondents who consider such ecosystems as ponds, streams and open mires to disturb their wilderness experience, and on the other hand, some respondents think that new wooden cottages and bleached milk cartons may strengthen their wilderness experience. Most of the respondents think clearly to the contrary about these things. To encounter a path or the place of an old campfire divides the attitudes of the respondents. Many of the responses fall into the class "has no effect on wilderness experience" telling that these things are considered as rather neutral according to many of the respondents. Nearly the same can be said about the effects of an old birch forest and little meadow with an old shed as well as a winter track for timber transportation. The latter mentioned is, however, considered clearly more disturbing than the two earlier mentioned things. The experience of being lost shares the attitudes rather clearly: about half of

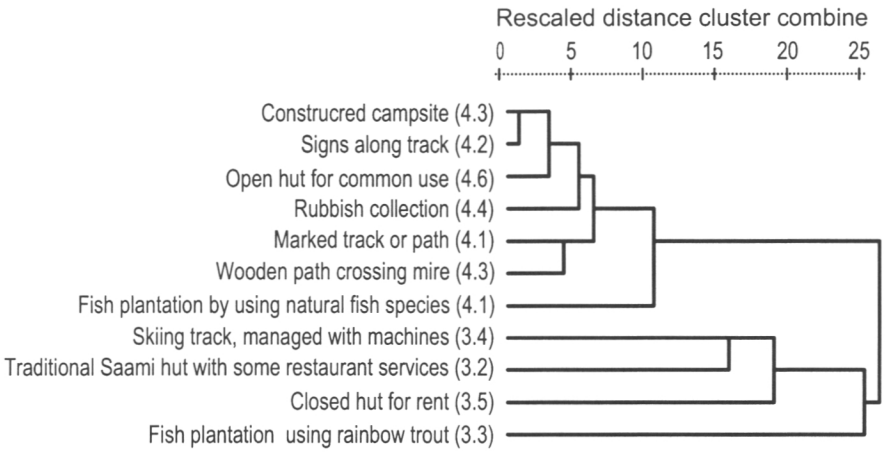


Fig. 24. The analysis revealing the clustering of the appropriateness of some management activities and constructions in the wilderness areas. The mean values of the evaluations are in the parentheses. The number of the respondents of Data Set 2 is 311–333. Ward's method has been used in the clustering.

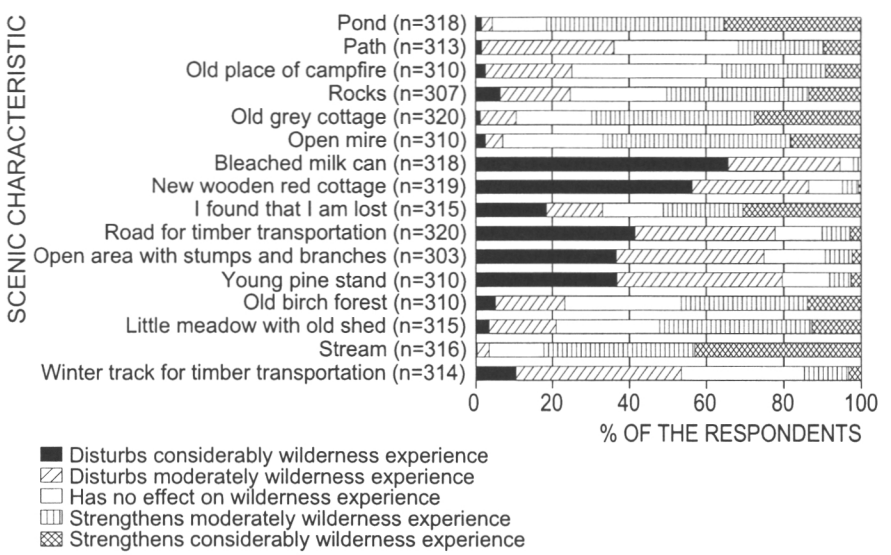


Fig. 25. The distribution of the effects of some scenic characteristics which a wilderness visitor encounters during his/her wilderness visit on his/her wilderness experience. The evaluations are based on the mental images of the respondents of Data Set 2.

the respondents feel this experience to strengthen their wilderness experience and about one-third feel that the experience disturbs their wilderness experience.

Furthermore, Figure 26 reveals that streams and ponds are the most important natural elements enhancing wilderness character besides open mires. Some old cultural elements, such as a small meadow with an old shed and an old gray wooden cottage used by occasional hunters in the middle of the forest are rather consistent with the Finnish idea of wilderness. Old paths and fireplaces are not regarded as very disturbing. The things scoring high on strong wilderness experience are grouped on the positive end on Dimension 1. On the other hand, roads and winter tracks for timber transportation as well as clear-cuts and young pine stands are inconsistent with the desired wilderness experience, although the winter tracks are not as disturbing as roads. Signs of modern culture, such as a new hut or litter, are evaluated as very disturbing. The effects of difficulties, such as rocks or especially being lost have low values in Dimension 2 telling that the wilderness experience varies very substantially from one person to another.

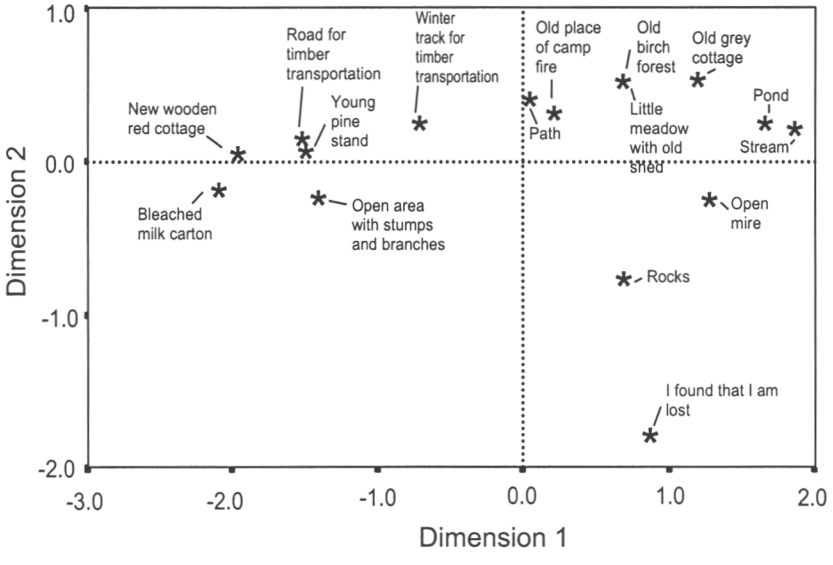


Fig. 26. The grouping of the effects of some scenic characteristics which a wilderness visitor encounters during his/her wilderness visit on his/her wilderness experience. The evaluations are based on the mental images of 303–320 respondents of Data Set 2. Kruskal's least squares monotonic transformation and the Euclidean distance model have been used in the computation.

6.1.6 The existence and location of wilderness areas in Finland

Besides the 12 statutory wilderness areas, the respondents have found many areas that they have found to promote their wilderness experience. In the following, the visits will be examined according to the responses of Data Set 1. According to the results, wilderness areas have been found in all parts of Finland (Fig. 27). The wilderness attraction indexes in Figure 28 reveal that Lapland has the strongest wilderness attraction, but the administrative district of Oulu and the northern part of Karelia have rather high values as well. It is remarkable that the districts of Keski-Suomi and Häme have clearly higher values of the index than the surrounding districts. The popularity of the national parks of Pyhä-Häkki and Seitseminen has a strong effect on the indexes of Keski-Suomi and Häme (see Appendix 5).

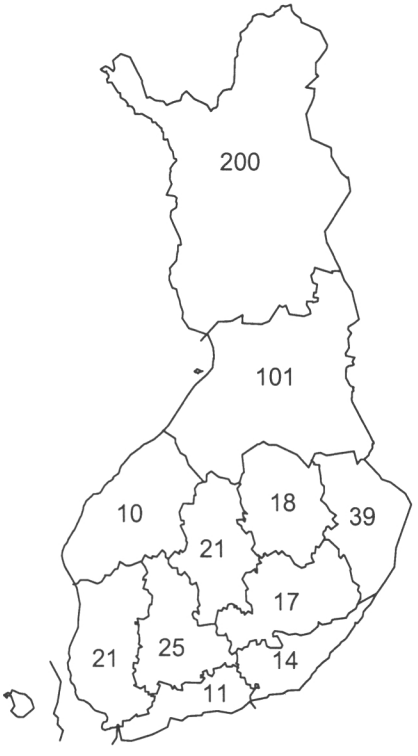


Fig. 27. The number of the most recent wilderness visits to the different administrative districts of Finland. The number of respondents is 435.

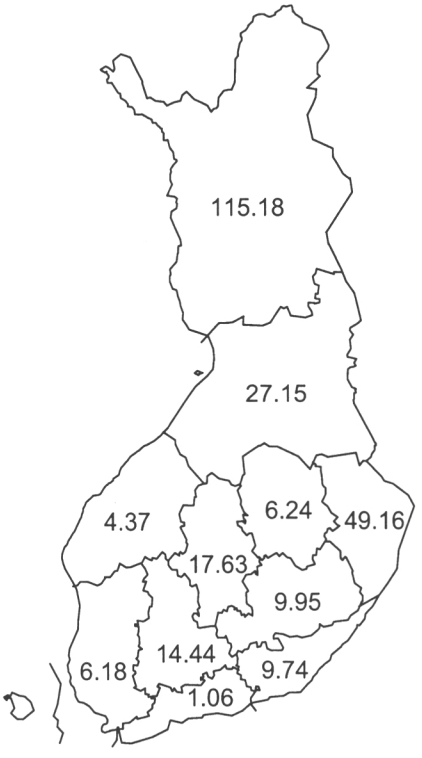


Fig. 28. The attraction index of the different administrative districts of Finland. The index is based on the number and the distance of the visits as well as the area of the district (see page 44).

Although the respondents have found wildernesses in their home districts, they have traveled a lot for their wilderness visits. Figure 29 tells us that the respondents have visited the wilderness areas of Oulu and Lapland from all the other districts. Nearly the same can be said about the wilderness areas of North-Karelia. Only the respondents of Lapland have not visited

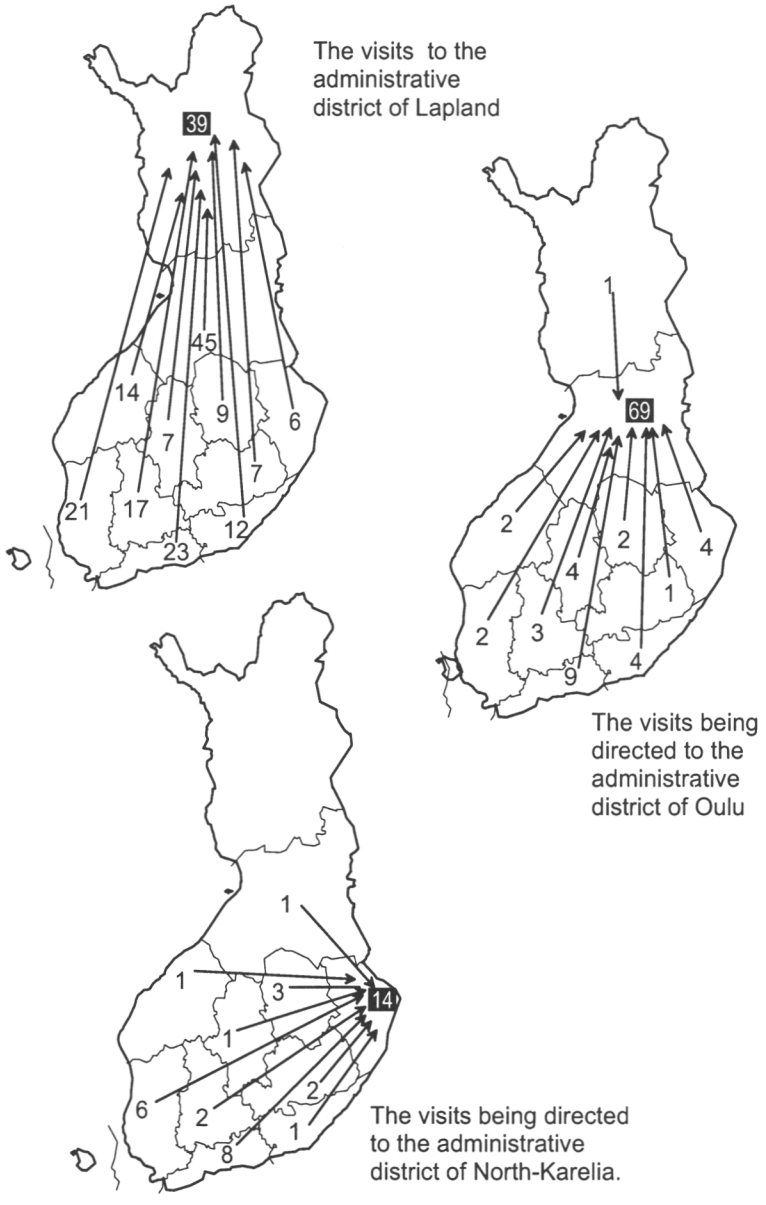


Fig. 29. The number of wilderness visits from certain administrative districts to the administrative district of North-Karelia, Oulu and Lapland. The number is expressed as a number at the base of an arrow. The framed numbers tell the number of wilderness visits having been directed to visitor's home administrative district.

North-Karelian wilderness areas. Although most of the wilderness visits have been directed to the north or east, some respondents have made rather long journeys to the south, west or southwest to have a wilderness experience (Fig. 30).

Appendix 5 reveals to us that about half of the wilderness visits have been directed to conservation areas. Urho Kekkonen National Park was the most attractive wilderness area (31 visits). The second on the list is Oulanka National Park (16 visits). If we sum the visits of Oulanka (in Kuusamo and Salla) and the visits of Kuusamo, we see that the municipalities of Salla and Kuusamo are very popular (28 visits). In spite of the fact that Pyhä-Häkki National Park in the district of Middle-Finland is a rather small park, it has been quite popular with its 10 visits.

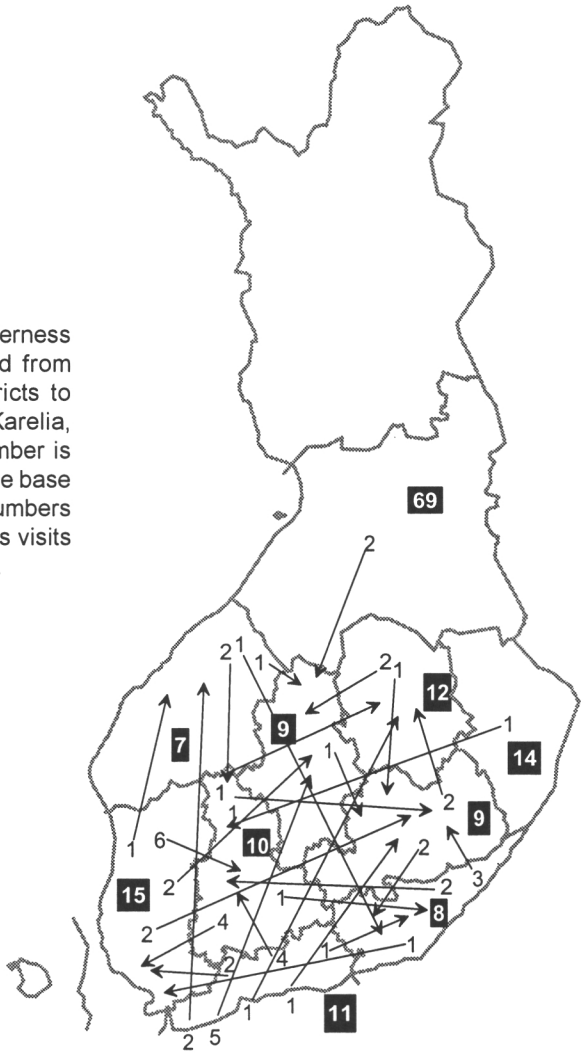


Fig. 30. The number of wilderness visits having been directed from certain administrative districts to other districts than North-Karelia, Oulu and Lapland. The number is expressed as a number at the base of an arrow. The framed numbers tell the number of wilderness visits in the visitor's home district.

Figure 31 reveals the results of an attempt to find out how some nature characteristics of the administrative districts correlate with the wilderness attraction indexes of the districts. Although the correlation coefficients are rather high, it is remarkable that the effect of Lapland, as a very strong outlier, affects very much all the coefficients. It may be, however, obvious that the wilderness districts are those characterized by poorly productive or waste lands and vast areas of protected land. The districts also have rather sparse inhabitation.

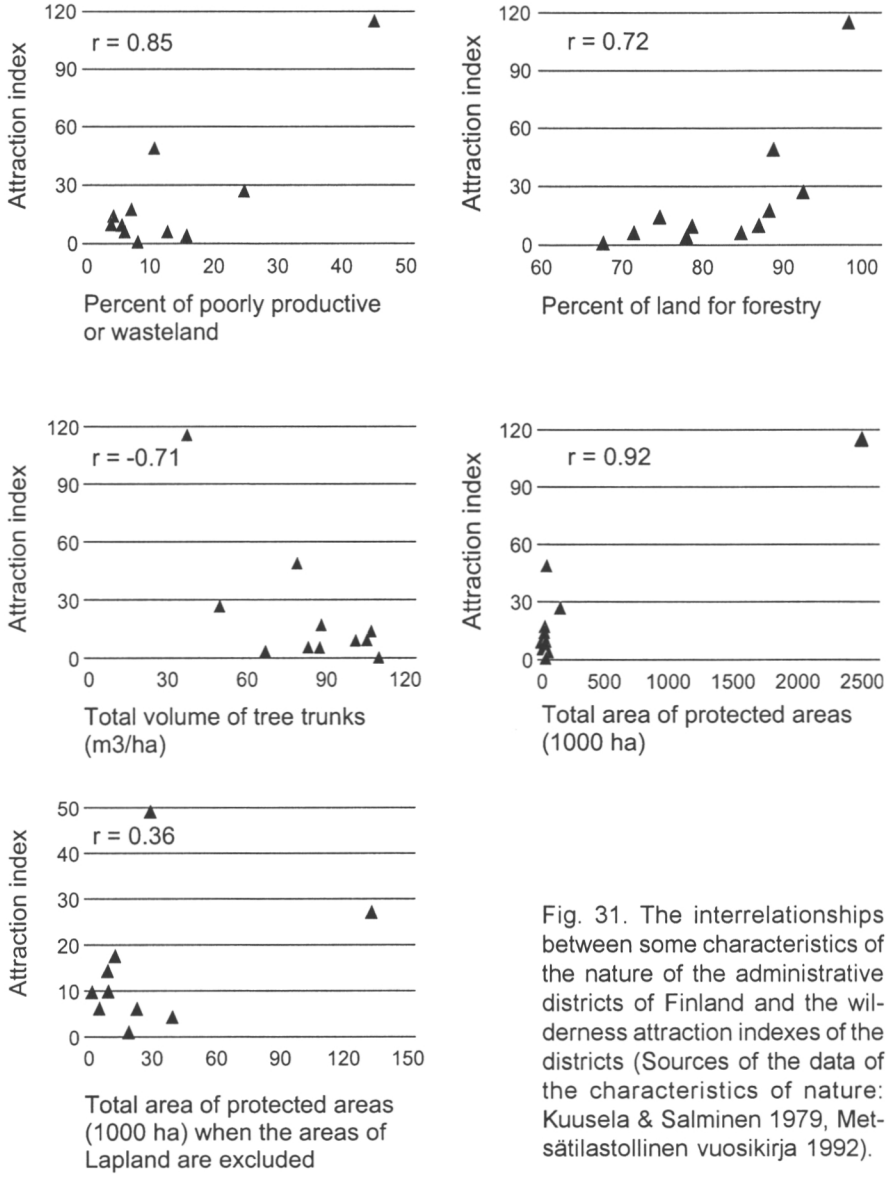


Fig. 31. The interrelationships between some characteristics of the nature of the administrative districts of Finland and the wilderness attraction indexes of the districts (Sources of the data of the characteristics of nature: Kuusela & Salminen 1979, Metsätilastollinen vuosikirja 1992).

The samples of those persons who did not respond were interviewed by telephone and asked their opinion about the location of wilderness areas in Finland. Sixty percent of them thought that there are the areas in their own country, thirty-three percent of them believed that the areas exist but they were not sure about it, and about seven percent did not want to express their opinion. According to the opinions, 52 percent said that wilderness areas are located in the northern part of the country, and 32 percent were of the opinion that wilderness areas are located in the eastern part of Finland. The expressions of the location of the wilderness areas were distributed as follows:

– Lapland	46.5 % of the expressions
– Kainuu	10.7 % of the expressions
– Häme	10.7 % of the expressions
– Satakunta	7.1 % of the expressions
– South-Karelia	7.1 % of the expressions
– North-Karelia	7.1 % of the expressions
– Koillismaa	7.1 % of the expressions
– Pohjanmaa	3.6 % of the expressions

One of the interviewed persons told that the wilderness areas are located north of the town of Jyväskylä, and one of them told that the areas exist on the north and south side of Kalajoki. Some of the interviewed persons mentioned the names of the areas or the municipalities were the areas are located. The opinions were the following: Seitseminen National Park (2 persons), Valkeala (2 persons), Peltovuoma in the Municipality of Enontekiö (1 person), Utajärvi (1 person) and Vaala (1 person).

Furthermore, ninety percent of the interviewed persons answered the question about the management of the wilderness areas. About seventeen percent of these people, however, had no firm opinion about it. Nearly half of those who answered (46.7 %) told that the areas should be retained in their natural state. About one-fifth accepted some carefully done cuttings in the areas, and slightly under seven percent accepted cuttings in certain parts of the areas but some areas should retain in their natural stage. Slightly over three percent told that the areas should be maintained as non-constructed. About one-tenth of the interviewed persons believed that the economical losses that conservation causes are of no account, but the same proportion believed that the losses are so mighty that at least some cuttings should be allowed in the wilderness areas.

6.1.7 The concept of wilderness and wilderness experience in Finnish narrative literature

Some descriptions about wilderness experience have already been described in section 2.3. The results of the conceptual content analysis reported in this chapter are based on a sample of Finnish narrative literature from the 1920s

to the 1990s. A.E. Järvinen was the most frequently cited author because of his long period as a writer, but many other well-known Finnish writers were selected for the specimen (sample) as well. The works had to be so-called "evergreens" among the wilderness literature. The most common expressions are presented in the following:

The frequency analysis reveals (for more details see Table 20) that wilderness concept is described using eight expressions: *kaira, salo* (backwoods), *takamaa* (backcountry), *metsämaa* (forestland), *metsä* (forest) and *luonnonpyhättö* (a sacred place in nature). The size of wilderness is described using 10 expressions such as: *laaja* (vast), *peninkulmainen* (many leagues vast), *rannaton* (without shore), *ääretön* (boundless) and *loppumaton* (endless). None of the authors characterized wilderness as a small area.

There are 96 different expressions about the atmosphere (experience) in wilderness. Expressions about the atmosphere are encountered 314 times. Nearly two hundred (191) of those expressions have been ranked as positive, but the expressions of oppression are rather often mentioned as well (53 expressions). Furtheremore, the effect of the presence or absence of culture on the atmosphere are mentioned rather often (36 expressions). The influences of the feelings of being induced by the location or extent of wilderness are mentioned 7 times. The most common adjectives describing the atmosphere of wilderness are: *hiljainen* (silent), *rauhallinen* (peaceful), *yksinäinen* (solitude), *asumaton* (uninhabited), *koskematon* (untouched) and *luomoava* (fascinating).

Thirty-one different words describing the features of ecosystems or terrain are mentioned. These words are encountered 312 times. About a third of the encountered words describe water (107), nearly the same number lands (83) and about one-fifth mires (63). The elements characterized by different main types of terrain with their vegetation types are mentioned nearly as often as mires (59). The majority of the characterizing of the vegetation describes forests (88 expressions from 97).

Animals are very often mentioned in Finnish narrative wilderness literature: 312–236 times have been encountered an expression of animals. The most often mentioned animals are *bear*, *wolverine* and *capercaillie.*

Human culture is not totally excluded in Finnish wildernesses according to the results of the content analysis. There are 41 different descriptions that have been encountered 91 times. Nearly half of the expressions (39) described occasional inhabitation and nearly a third permanent inhabitation (26). Traditional hunting and fishing as well as fields and meadows used by these inhabitants are often mentioned as consistent features with wilderness.

Besides the content analysis made using a frequency analysis technique, some descriptions about the Finnish concept of wilderness, and ideas and experiences will be cited in the following using the sample of narrative

Table 20. The most common expressions of wilderness and the wilderness characteristics that appear in the Finnish narrative literature. The data of the content analysis of literature consists of 3705 pages, 20 volumes and 13 authors.The percent denotes the percent of the expression in the category (Cat.).

The characteristic of wilderness in seven categories	**Descriptive word in Finnish**	**Descriptive word in English**	**Frequency**	**%**
Cat. 1: Expression of wilderness	Erämaa	Wilderness	305	40.1
(Total number of expressions is 761)	Kaira	Backwoods	196	25.8
	Salo	Backwoods	113	14.8
	Takamaa	Remote district	3	0.4
	Metsämaa	Forested land	2	0.3
	Metsä	Forest	2	0.3
	Luonnonpyhättö	A sacred place in nature	1	0.1
Cat. 2: The size of wilderness	Suuri	Vast	37	41.6
(Total number of expressions is 89)	Peninkulmainen	Many leagues vast	21	23.6
	Rannaton	Without shore	7	7.9
	Ääretön	Boundless	6	6.7
	Loppumaton	Endless	4	4.5
Cat. 3: The atmosphere of wilderness	Hiljainen	Silent	41	13.1
(Total number of expressions is 314)	Rauhallinen	Peaceful	38	12.1
	Yksinäinen	Lonely, Solitary	22	7.0
	Asumaton	Uninhabited	14	4.5
	Koskematon	Untouched	12	3.8
	Lumoava	Fascinating	10	3.2
Cat. 4: The ecosystems of wilderness	Metsä	Forest	52	16.7
(Total number of expressions is 312)	Tunturi	Fell	45	14.4
	Järvi	Lake	38	12.2
	Vaara	Wooded hill	26	8.3
	Suo	Mire	25	8.0
	Joki	River, Stream	22	7.1
Cat. 5: The vegetation of wilderness	Kuusikko	Norway spruce stand	28	28.9
(Total number of expressions is 97)	Honka	Old and tall pine	19	19.6
	Männikkö	Scotch pine stand	8	8.2
	Petäjä	Scotch pine	8	8.2
	Kelo	Dead tree, snag	8	8.2
Cat. 6: The animals of wilderness	Karhu	Bear	38	12.2
(Total number of expressions is 312)	Ahma	Wolverine	20	6.4
	Peura	Wild reindeer	10	3.2
	Hirvi	Elk, Moose	9	2.9
	Ilves	Lynx	9	2.9
	Hanhi	Goose	8	2.6
	Peto	Beast	8	2.6
	Poro	Reindeer	7	2.2
	Huuhkaja	Eagle-owl	7	2.2
Cat. 7: Constructions in wilderness	Pysyvä asutus kuten erämaatalo, salokylä	Permanent inhabitation, like a wilderness house or village	40	43.0
(Total number of expressions is 93)	Tilapaäinen asutus	Occasional inhabitation	39	41.9
	Kämppä	Hut	19	20.4

Sources in alphabetical order: Huhtanen (1988), Hägglund (1989), Järvinen (1924, 1934, 1942, 1953, 1962), Kariniemi-Willamo (1958), Lampio (1930, 1936), Montonen (1974), Munsterhjelm (1946, 1949), Mäensyrjä (1979), Nuutinen (1933), Nyholm (1974), Pyykkönen (1938), Virkkula (1926), Wallenius (1936, 1951).

literature. The citations are mentioned as examples representing a period of about sixty years of Finnish wilderness classics. The citations have been translated into English.

> *"...I felt a great feeling to bustle here far away from human inhabitation, in the arms of the silent and peaceful wilderness."* (Lampio 1930, p. 164).

> *" ...Everyone of them was aware of the vast wilderness areas of Lapland as their own estates."* (Kariniemi-Willamo 1958, p. 18).

> *"... There is another realm across the river. Silent wilderness for many days of hiking."* (Huhtanen 1988, p. 165).

> *"... When a precentor wandered into vast forests..., he spent a lot of time in the company of God."* (Järvinen 1962, p. 107).

> *"... There is a real primitive spruce forest. Extremely mighty and bearded are those trees... and lying on the ground... the deceased of the forest, fathom long mighty trees."* (Wallenius 1951, p. 137).

> *"...The areas between the backwood areas full of bears...and a lonely wilderness house of Pokka are mentioned to be perhaps the most oppressive wilderness areas in Lapland, mostly consisted of terrible brushwood inhabited by the most timorous wildlife, bears, wolverines and geese."* (Nuutinen 1933, p. 105).

> *" Again, it is good to leave to hear silence, whizzing of the wind, voices of the melting ice and the authentic stresses of the people of wilderness. There in the wilds it is allowed to forget rattling games of the gambling halls, impurities of traffic, abundance of fancy goods, the important briefcases of marketing men, rush and fear."* (Huhtanen 1988, p. 60).

> *" The human inhabitants of these backwoods still have healthy instincts. They know that they belong to the entirety."* (Huhtanen 1988, p. 181).

Thus, Finnish narrative literature names wilderness most often using the Finnish word *erämaa*. The words *kaira* and *salo* (backwoods) are also often mentioned by the authors. Although forest, especially old virgin forest, appears to be the most important ecosystem component in wilderness, mires as well as lake and river systems are important too. Wild animals are a natural part of the wilderness, but sparse human inhabitation is also consistent with the idea of Finnish wilderness. People who have lived a long time in

the wilderness are 'real' human beings and they have begun as a part of the area they live in. Wilderness is near the existence of Finnish people. Although wilderness may be a lonely, painful, and even threatening area, mostly it has been experienced as a rather cheerful and inspiring area, nearly as a part of home.

Many of these authors have described the things that they have found which threaten the wilderness character of Finnish nature. The following descriptions have been found in the sample of narrative literature and translated into English. First the feelings of Nuutinen (1933, p. 206):

> *"...the nature, the land of our ancestors is in danger to be robbed and destroyed...Forests will be cut, mires will be drained, rapids will be harnessed to serve man's purposes, the originality of the nature will be destroyed, the most noble pearls, the ancient memorials will be scandalized...No other aspects besides money are taken into account."*

At the same time Järvinen (1934, p. 54–55), a forest officer himself, wrote:

> *" And our world has changed very much. They have built their roads here close to these wilderness areas, and cars speed along these roads. It is unpeaceful in the wilderness nowadays, they cut forests and bustle in the places where in the past hiked hardly no other human beings than Aaretti and some reindeer herders."*

About thirty years later Järvinen (1962, p. 148 and 278) described his feelings as follows:

> *" The backwoods was one of those rare things that have been maintained in its natural state...There were snags there for log fires, although they have all totally vanished from many other backwoods, such as everything else belonging to nature."... "One cannot find wood for log fire, birds to hunt, even a forest. Instead of the forest, where I once lived the best moments in my life, there are only tree stumps left, clear-cut areas as far as the eye can see, and high stacks of slash to make roaming more difficult."*

Thus most of the threats concern forestry activities. These activities have been considered as a threat to the survival of the Finnish wilderness for decades. Roads for timber transportation allow a man to reach the forests in order to cut them down, and they are used for easy access for outdoor recreation as well. Thus the backwoods have become unpeaceful. The originality of nature has been very important for the authors, and it is obvious that there is not enough money to compensate for the vanishing of this originality according to certain authors. Furthermore, there is a threat that the old traditional hunting and wildlife traditions, or at least the experiences that these traditions promote, vanish with the changing forest environment.

6.2 Outdoor recreation in Finnish nature and wilderness

6.2.1 Outdoor recreation in Finnish nature, some features, motives and activities

In this section, the results of outdoor recreation of the respondents of Data Set 2 in Finnish nature will be presented. The outdoor recreation environment consists of wilderness and non-wilderness areas. In the questions, the recreation environment has been called 'nature' and it has been defined to the respondents as an environment where nature characteristics dominate. The aim of this questionnaire is to expand the results of the wilderness recreation questions in Data Set 1 and compare some of the results with each other. Reading the results, one should keep in mind that the respondents of Data Set 2 do not represent the Finnish population as well as a completely random sample would. Thus, the results cannot be directly generalized to the population. Some differences between the groups of the respondents may be due to sampling error as well. Although there are some biases and special features in the data, most of the results will reveal interesting and reliable features of the outdoor recreation desires and habits of Finnish people.

To find out how well the seasons promote outdoor recreation, the respondents were asked how often they visit, and wish to visit, in nature during the seasons. The frequency of the visits was defined as follows: 'seldom' denotes once a month or more rarely, 'fairly often' denotes about once a week or two weeks and 'very often' denotes daily or nearly daily. As an answer to the question, summer and autumn are considered as the best seasons for outdoor recreation. Over two-fifths of the respondents visit nature very often in summer and autumn. Summer is a bit more popular than autumn. Winter is the least favored season for the purpose. Spring is the season to visit rather often in nature, in general. It is noticeable, however, that about one-fourth of the respondents seldom visit nature in spring and one-third in winter. Over 60 % of the respondents visit nature at least fairly often every season, and there are only a few respondents who never visit nature (Fig. 32). The pattern is quite similar when talking about the desired visits, meaning how often the respondents would like to visit nature. In general, the respondents want to visit nature more often than they do (Fig. 33). The differences between the seasons are statistically significant (Pearson's chi-square test's $p=0.000$).

There is a statistically significant correlation under a 5 % risk level between the frequency of nature visits that have been made and the frequency of the desired visits. In general, there is a tendency for people to want to visit nature as often as or more often than they actually do. When observing those respondents who seldom visit nature, about from 60 (in winter) to 80 (in summer) percent wish to visit nature more often than they do. The corresponding proportion of those who visit rather often in nature is about two-

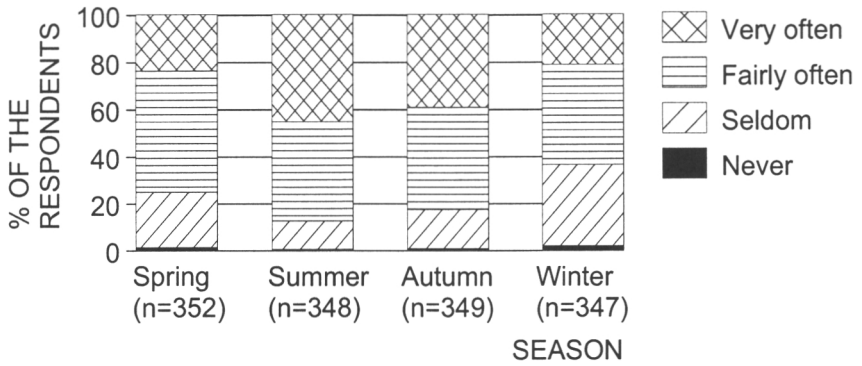


Fig. 32. The percent distribution of the nature visits of the respondents of Data Set 2 when they have been asked how often they make their nature visits.

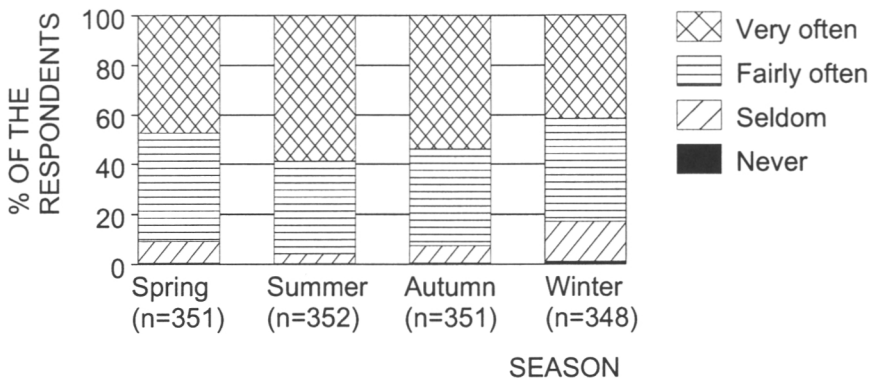


Fig. 33. The percent distribution of the desired frequency of nature visits of the respondents of Data Set 2 when they have been asked how often they are willing to make their nature visits.

fifths in every season. There are, however, some respondents who have answered that they visit nature more often than they actually wish to (Table 21).

The respondents were also asked the duration of their last vacation and how many days they had spent in nature. In the computations, employed people and students have been taken into account. The median number of days of the vacation is about 25 days and about one-fourth of the days have been spent in nature. There are, however, respondents who have had much longer vacations, and many of them have spent half or more of the time in nature. The interrelationship between the length of the vacation and the days spent in nature becomes linear after log-transformations of the variables.

Table 21. The frequency of nature visits done by the respondents of Data Set 2 and their wish to visit in nature during different seasons.Column r denotes Spearman's rank order correlation coefficient and p 99 % confidence limits of the significance of the coefficient using exact Monte Carlo -algorithm in the test.

Season	Frequency of visits	Frequency telling how often the respondents wish to visit in nature, number and proportion (row percentages) of the respondents				n, total %	r	p
		Never	Seldom	Rather often	Very often			
Spring	Never	2 (50.0)		2 (50.0)		4 (1.1)	.588	.000–.001
	Seldom		28 (34.1)	41 (50.0)	13 (15.9)	82 (23.6)		
	Rather often		2 (1.1)	101 (56.1)	77 (42.8)	180 (51.7)		
	Very often			7 (8.5)	75 (91.5)	82 (23.6)		
Summer	Never	1 (100)				1 (0.3)	.595	.000–.001
	Seldom		8 (19.0)	26 (61.9)	8 (19.0)	42 (12.1)		
	Rather often		4 (2.7)	88 (59.9)	55 (37.4)	147 (42.5)		
	Very often		1 (0.6)	14 (9.0)	141 (90.4)	156 45.1)		
Autumn	Never	1 (50.0)	1 (50.0)			2 (0.6)	.619	.000–.001
	Seldom		20 (34.5)	32 (55.2)	6 (10.3)	58 (16.7)		
	Rather often		3 (2.0)	85 (56.3)	63 (41.7)	151 (43.5)		
	Very often			17 (12.5)	119 (87.5)	136 (39.2)		
Winter	Never	3 (60.0)	2 (40.0)			5 (1.4)	.580	.000–.001
	Seldom		45 (37.5)	56 (46.7)	19 (15.8)	120 (34.7)		
	Rather often		6 (4.1)	79 (53.7)	62 (42.2)	147 (42.5)		
	Very often		2 (2.7)	8 (10.8)	64 (86.5)	74 (21.4)		

The multiple squared r of the linear regression model after transformations is only 0.56 (Fig. 34).

Figure 35 reveals that there is only a little variation in the number of days of the last vacation and the days spent in nature between different groups of the respondents when the vacations of at most 60 days have been taken into account. Kernel's non-parametric estimator curves of the different groups lie mostly on and inside each other. The heteroscedastic pattern in the scatter plots, i.e. the growing variances in the days spent in nature with growing length of the vacation, is obvious in each of the groups, even inside the 68 % density areas of Kernel's estimator. Many students and some white-collar employees have the longest vacations, countryside dwellers, entrepreneurs and the respondents who have the lowest education have shorter vacations compared with the reference groups. Furthermore, the males and the youngest group of the respondents had slightly longer vacations than the females or the older respondents. When the focus is set on the respondents who have vacations longer than 60 days, it is evident that those respondents who have spent a great deal of their vacation in nature are rather highly educated young men, students or white-collar employees who are living in southern or eastern part of Finland.

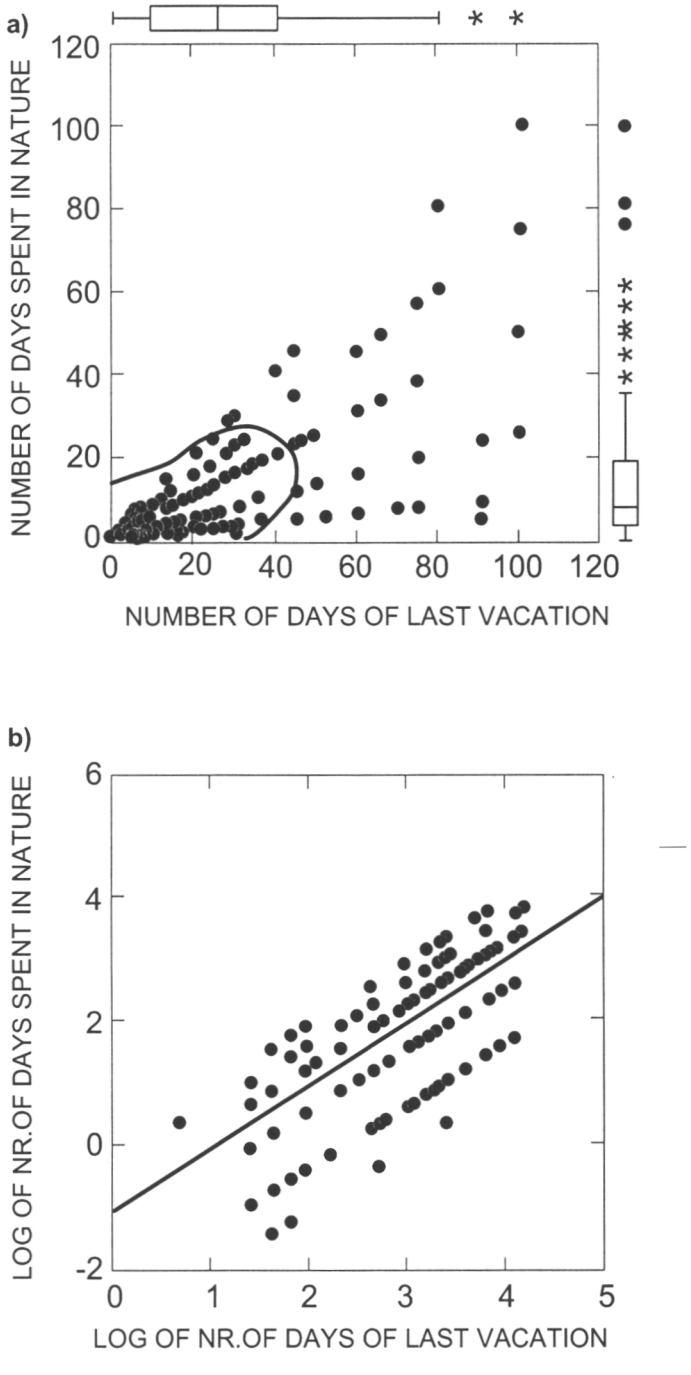


Fig. 34. Scatterplots describing the interrelationship between the number of days of last vacation of the respondents of Data Set 2 and the number of days they have spent in nature during the vacation. The line inside Plot A describes Kernel's non-parametric estimator of concentration using a p-value of 0.68. Plot B describes the interrelationship after log-transformation of the variables and the elimination of two outliers.

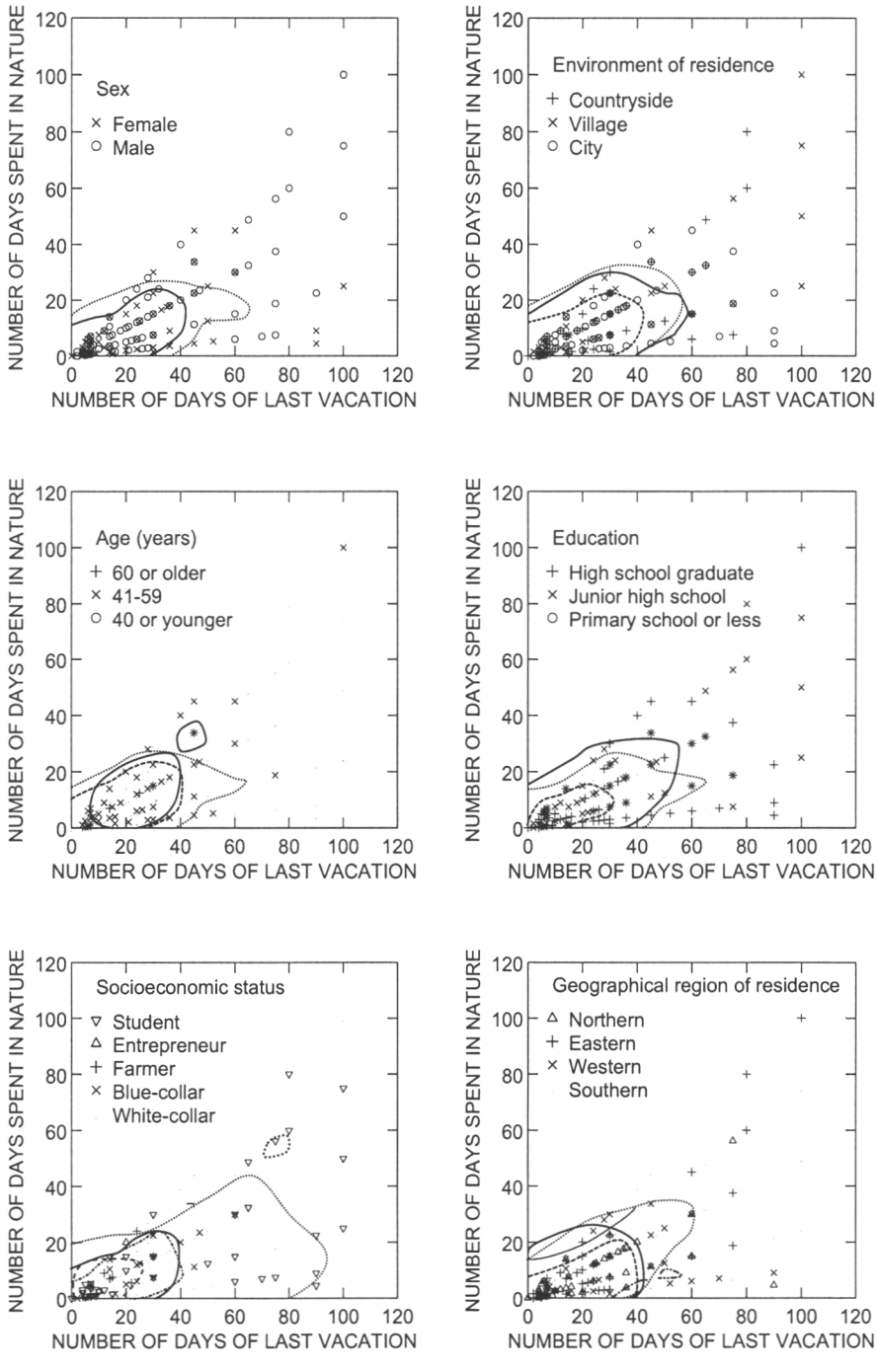


Fig. 35. Scatterplots describing the interrelationship between the number of days of last vacation of the respondents of Data Set 2 and the number of days they have spent in nature during the vacation by groups of the respondents. The lines inside the plots describe Kernel's estimator of concentration using a p-value of 0.68.

Table 22 reveals the timing of the nature visits that have been taken, and what is the time when the respondents want to visit nature. Weekends are the most preferred and holidays the second preferred times for nature visits. It is the same for the respondents who have been employed or students as well as those who have been unemployed or pensioners during the last year. More than 85 % of the employed persons, students and unemployed as well as over half of the home-makers visit nature during their weekends. Furthermore, from one-third to nearly a half of the respondents use a part of their daily leisure time for their nature visits, and some of them who do not use the time for nature visits would like to use it for the purpose.

It is noticeable that some employed respondents, students and unemployed persons tell that they have visited nature although they do not want to visit during weekends. Another interesting observation is that only one-third of the employed persons and students express their wish to visit nature if they were pensioners or unemployed. About two-thirds of unemployed and nearly all pensioners, however, tell that they have visited nature during their pension or unemployed time. Furthermore, some of the respondents belonging to the latter mentioned group tell that they do not wish to visit nature although they have done so (Table 22).

Table 22. The nature visits of the respondents of Data Set 2 and the respondents' wish to visit in the nature. Note that an unemployed respondent, or a respondent working at home may also have been studying or working outside the home during the asked year.

Group of the respondents	**The time of the visits**	**Visits in the nature, %**	**n**	**Want to visit in the nature, %**	**n**
Workers or students	During daily freetime	46.4	289	50.7	288
	During weekends	88.9	289	82.6	288
	During holidays	66.8	289	70.8	288
	During working or studying time	20.4	289	37.2	288
	During unemployment	19.0	289	28.5	288
	During pension time	–	–	34.4	288
Unemployed persons	During daily freetime	36.1	82	42.2	82
	During weekends	85.4	82	78.0	82
	During holidays	45.1	82	57.3	82
	During working or studying time	11.0	82	37.8	82
	During unemployment	63.4	82	59.8	82
	During pension time	–	–	34.1	82
Pensioners	During pension time	98.0	50	94.0	50
Home-makers	During daily freetime	44.4	9	44.4	9
	During weekends	55.6	9	66.7	9
	During holidays	44.4	9	66.7	9
	During unemployment	–	–	22.7	9
	During pension time	–	–	33.3	9
	During working time	0.00	9	11.1	9

The frequencies in Table 23 tell that only about 10 % of the respondents have visited nature at least every second day, and about two-thirds have visited there after every tenth day or more rarely when talking about day visits. Over 90 % of the respondents have done at most ten weekend visits and one-third have done one or more longer visits during the latest year. Two-thirds of the respondents have not made nature visits of more than two days during the last year.

When the respondents were asked how long and challenging visits they *are willing* to do, it became evident that about one-sixth of them are not willing to do any day visits and about two-fifths are not willing to do longer visits than two days. On the other hand, about half of the respondents want to do easy day visits and one-third easy visits lasting more than two days. Furthermore, one third of the respondents express their will to do challenging visits lasting one day or more. A much bigger proportion of the day visitors want to do easy visits compared to weekend visitors or persons who do longer than weekend visits. This means that those who want to make the visits that would last for many days, obviously want to encounter more challenges during the visits compared with the day visitors (Fig 36).

Table 23. The frequency distribution of the number of nature visits of different duration during a year. The data consists of Data Set 2. Column n denotes the number of the respondents that have answered the question.

The length of visits	Number of visits	Number of respondents			n
		Frequency	%	Cumulative %	
Day visits (lasting 10 hours or less)	25 or less	187	58.4	58.4	320
	26–50	62	19.4	77.8	
	51–75	16	5.0	82.8	
	76–100	24	7.5	90.3	
	101–125	4	1.3	91.6	
	126–150	4	1.3	92.8	
	151–175	1	.3	93.1	
	176–200	13	4.1	97.2	
	201 or more	9	2.8	100.0	
Weekend visits (lasting 1–2 days)	10 or less	293	90.7	90.7	323
	11–20	16	5.0	95.7	
	21–30	3	.9	96.6	
	31–40	4	1.2	97.8	
	41–50	2	.6	98.5	
	50 or more	5	1.5	100.0	
Visits lasting longer than weekend (3 days or more)	0	216	66.3	66.3	326
	1	39	12.0	78.2	
	2	28	8.6	86.8	
	3	18	5.5	92.3	
	4	8	2.5	94.8	
	5	8	2.5	97.2	
	6 or more	9	2.8	100.0	

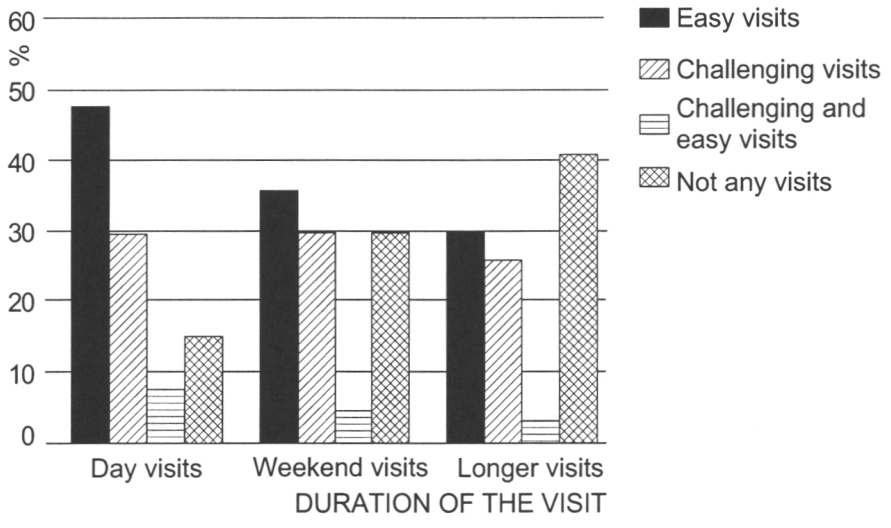


Fig. 36. The effect of the duration of the nature visits that the respondents of Data Set 2 want to do on the desired challenge level of the visits. The numbers of the respondents by the groups are: day visits 335, weekend visits 322, and longer visits 313. The % denotes the percent of the respondents. Weekend visits denotes the visits of two days and longer visits the visits lasting three days or more. The p-value of Pearson's chi-square test is 0.000.

Furthermore, the respondents were asked about what type of accommodation they were willing to *stay overnight* in in nature. Most of the respondents want to spend their night inside. Their own cabin is the most preferred accommodation, but open huts for common use or huts for rent are important as well. About one-fourth of the respondents want to stay overnight outside, in a tent or another shelter made of fabric, or just under the sky. Only a minority of the respondents do not stay overnight in nature at all (Fig. 37).

There are, however, differences in the respondents' wishes to stay overnight in nature between the groups of respondents. The bigger part of the older respondents and of those who have spent their childhood in the countryside and are working in administrative, office or commercial occupations as white-collar employees or who are farmers, want to spend their nights inside or do not stay overnight in nature at all. Furthermore, the young and middle-aged respondents are more willing to spend their nights in nature compared with the pensioners. Similarly, the respondents belonging to the youngest group (persons who are at most 40 years old) want more often than the older persons to stay their night outdoors. The same can be said about the respondents who have spent their childhood in the southern or northern part of the country. Moreover, a big proportion of industrial workers wants to stay the night outdoors compared with the other occupation groups. On the other hand, many of the blue-collar employees do not want

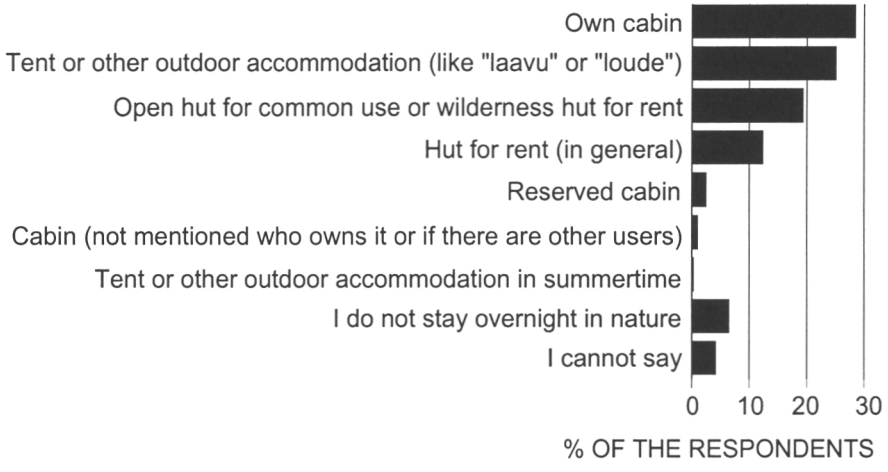


Fig. 37. The desired accommodation of the respondents of Data Set 2 to stay overnight in nature, n=355.

to stay the night in nature at all, the proportion being the biggest among the occupation groups. Although there are statistically significant differences between the groups in their will to stay overnight in nature, the uncertainty coefficients reveal that the groups explain from 2.6 % to 2.8 % of the variation in the preferences, but the explained portion is statistically significant under a 5 % risk level (Table 24).

To find out *why* the respondents visit nature and *what are they doing* there, the respondents were asked to choose among the given alternatives their first, second and third most important motives for visiting nature and their activities during their nature visits. Furthermore, the respondents were asked to name their own motives and activities if they could not find the motives among the ready-made alternatives.

The sums of scores in Figure 38 reveal that the experience of peace and silence, beautiful scenery and physical training are the three most important activities of the respondents of Data Set 2. After that, there comes the group of five motives that stand out rather clearly: to get prey (game, fish, berries, mushrooms or photographs), to avoid everydayness, togetherness, the experience of freedom as well as the respondents intention to see plants and animals. The great difference between the scores of togetherness and solitude is noticeable.

Wild berries or mushrooms are very important for the respondents. To pick these natural products is the most important activity during the nature visits, even more important than the outdoor exercise by walking, jogging or skiing along ready-made tracks. After these activities comes hiking and trekking, hunting or fishing as well as observing living nature. Only a little

Table 24. The preferences of the respondents of Data Set 2 to stay overnight in nature when the opportunities are to stay overnight indoors, outdoors or not to stay overnight by groups of the respondents. Column n denotes the number of the respondents, p the Monte-Carlo estimated exact p-value of Pearson's chi-square test and uc denotes the uncertainty coefficient with the preference to stay overnight (dependent). Only the variables with statistically significant differences in the tests using 5 % risk level have been taken into account.

Variable	Group of the respondents		Preference to stay overnight					Preference to stay overnight, group "Do not stay" omitted			
		n	Indoors, %	Out-doors, %	Do not stay, %	p	uc	Indoors, %	Out-doors, %	p	uc
Age (years)	40 or less	175	60.6	35.4	4.0	.000–.000	.063	63.1	36.9	.000–.000	.063
	41–59	115	70.4	22.5	6.1			75.0	25.0		
	60 or more	46	78.3	2.2	19.6			97.3	2.7		
Environment of residence during childhood	City	79	65.8	30.4	3.8	.034–.044	.026	68.4	31.6	.499–.525	.004
	Village	54	77.8	22.2	0.0			77.8	22.2		
	Countryside	186	65.6	24.2	10.2			73.1	26.9		
Geographical region of residence during childhood	Southern	63	55.6	38.1	6.3	.007–.013	.050	59.3	40.7	.018–.026	.027
	Western	69	68.1	23.2	8.7			74.6	25.4		
	Eastern	79	73.4	15.2	11.4			82.9	17.1		
	Northern	108	66.7	31.5	1.9			67.9	32.1		
Occupation	Technical, scientific	75	70.7	18.7	10.7	.015–.022	.065	79.1	20.9	.000–.003	.070
	Social, health care	45	75.6	20.0	4.4			79.1	20.9		
	Administrative, office	18	88.9	11.1	0.0			88.9	11.1		
	Commercial	23	82.6	8.7	8.7			90.5	9.5		
	Agriculture, forestry	78	70.5	25.6	3.8			73.3	26.7		
	Traffic, transportation	6	66.7	33.3	0.0			66.7	33.3		
	Industry	48	41.7	45.8	12.5			47.6	52.4		
	Service	30	60.0	33.3	6.7			64.3	35.7		
	School children	4	100.0	0.0	0.0			100.0	0.0		
Socioeconomic status	Upper white-collar	83	73.5	20.5	6.0	.002–.005	.065	78.2	21.8	.000–.000	.082
	Lower white-collar	83	80.7	13.3	6.0			85.9	14.1		
	Blue-collar	76	46.1	43.4	10.5			51.5	48.5		
	Farmer	19	73.7	15.8	10.5			82.4	17.6		
	Entrepreneur	4	100.0	0.0	0.0			100.0	0.0		
	Student	68	58.8	36.8	4.4			61.5	38.5		
	Home-maker	3	100.0	0.0	0.0			100.0	0.0		

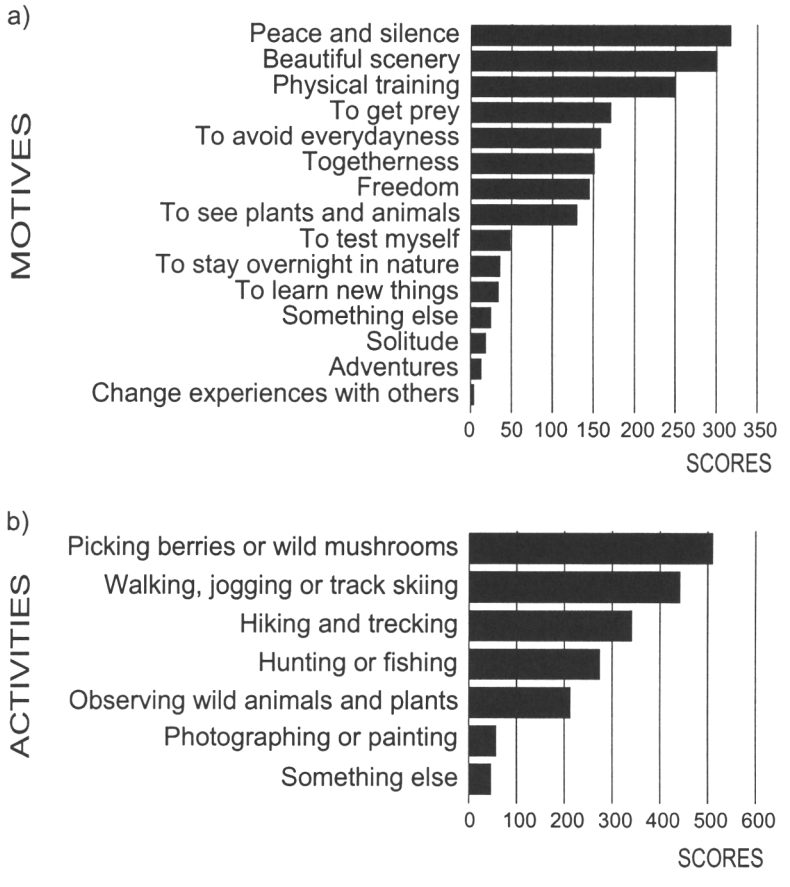


Fig. 38. The scores of the motives (a) and activities (b) of nature visits of the respondents of Data Set 2. The scores have been computed as a sum of points (scores) when the first important motive has been given 3 points, the second important motive 2 points and the third important motive 1 point.

group of the respondents is interested in arts in nature. Besides the ready-made alternatives the respondents mentioned the activities such as working, scouting, forest management, cycling, driving snowmobiles, game management, making foliage bundles, swimming, survival trips, making spirits or just spending their time in nature without doing anything, only relaxing.

Only about 10 % of the variation in primary motives can be explained by the primary activities. There are, however, statistically significant differences in the motive constructions between different activities (Fig. 39). The experience of peace and silence is important to nearly all activity groups. It is least important to hunters or fishermen. It is notable that getting prey is the most important motive (the first motive) only to one-fifth of the berry or mushroom pickers and to one-third of the hunters or fishermen. Freedom is very important to one-tenth of the respondents, except to the persons whose primary motive is to pick berries or mushrooms. Physical training is the

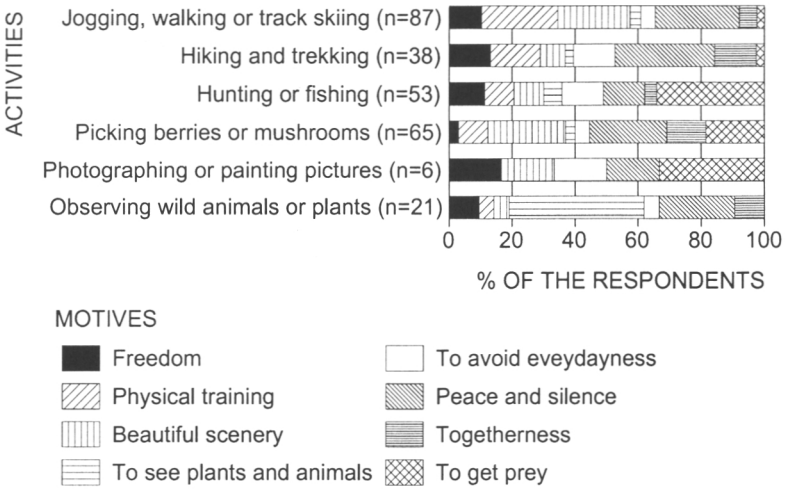


Fig. 39. The interrelationship between the primary motives and primary activities of nature visits of the respondents of Data Set 2. Pearson's chi-test's Monte-Carlo -estimated exact p=0.000. The value of the uncertainty coefficient with motive (dependent) is 0.095. The Monte-Carlo -estimated p-value of the coefficient is 0.000–0.001.

most important motive only to a few of the respondents except those who are the most interested in jogging, walking outdoors or skiing along ready-made tracks or to some hikers. One surprising thing is that beautiful landscapes are the most important motive to a bigger part of berry or mushroom pickers as well as jogging, walking or track skiing persons than to hikers. Furthermore, escape from everydayness is most important to hikers, hunters or fishermen. Mainly hikers and berry or mushroom pickers want to share their experiences in nature with other persons.

The motives and the activities of the *groups of the respondents* have been examined to characterize certain types of nature visitors despite the fact that the types may be rough stereotypes. In addition to the cross-tabulations with the tests that are closely related to the tables (Pearson's chi-square test and uncertainty coefficient), logistic regression has been used to find out more reliable interactions between the grouping variables and the primary motives as well as the grouping variables and the primary activities. Logistic regression models are thus the "spine" of the typology. The typology has been completed using frequency distributions and chi-square tests. Before selecting the variables into the logistic regression models, the effects of the grouping variables on a single motive or activity have been studied using cross-tabulation and chi-square tests. Only the variables with significant differences at a 5 % risk level revealed by the latter mentioned test, have been taken into account in the model constructions (Figures 40 and 41, Tables 25, 26, 27 and 28). However, because of rather sparse frequencies

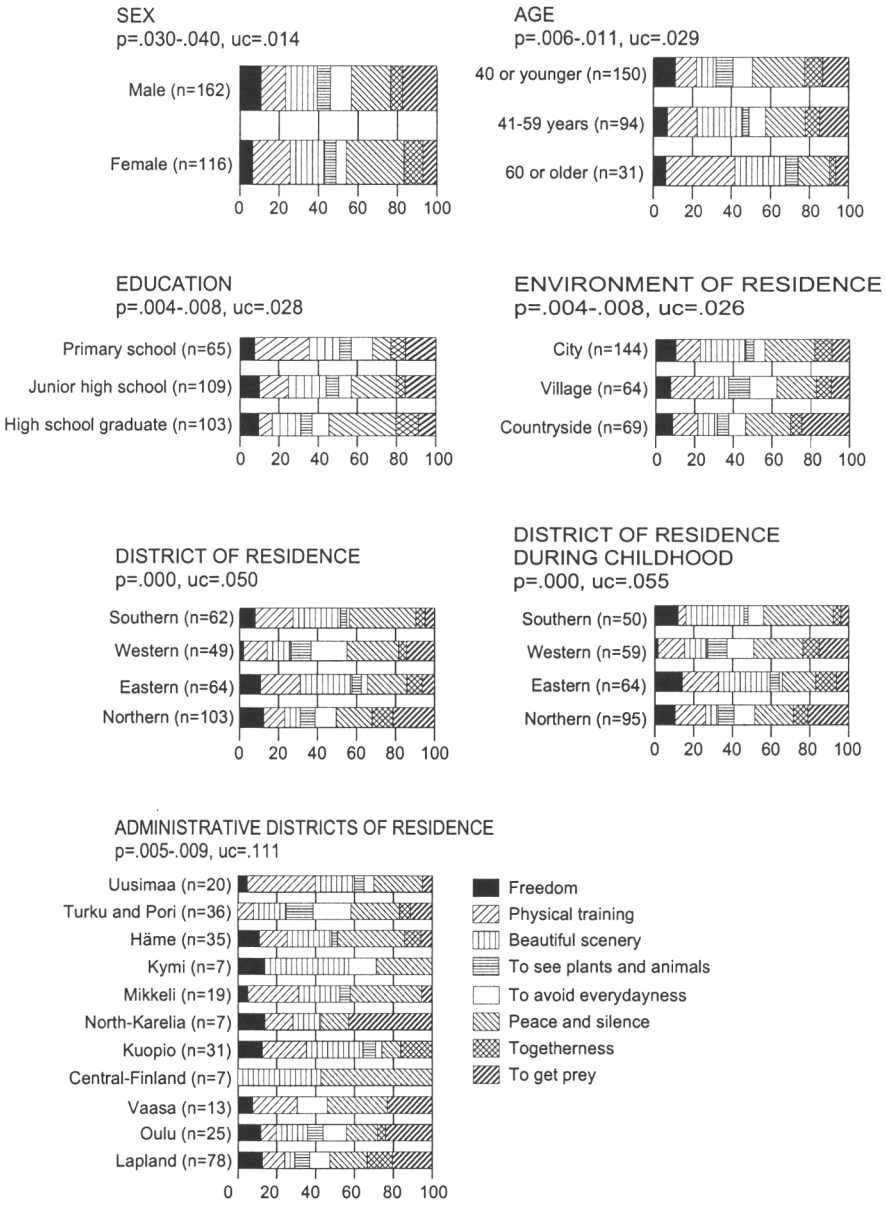


Fig. 40. The distribution of the primary motives by the groups of the respondents of Data Set 2. P denotes the Monte-Carlo -estimated exact p-value of Pearson's chi-square test and uc the uncertainty coefficient with motive (dependent). Only the significant results using 5 % risk level are presented.

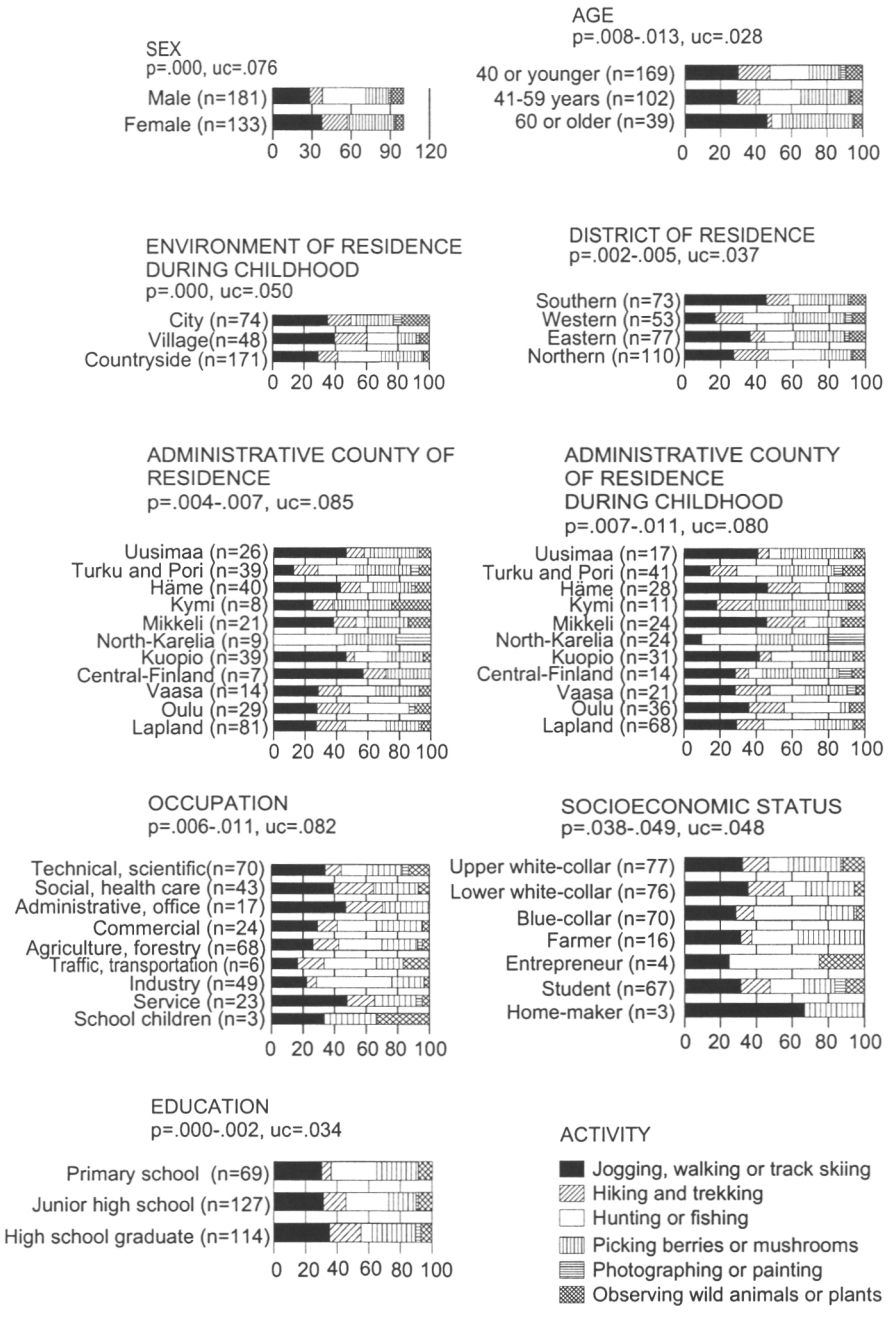


Fig. 41. The distributions of the primary activities by the groups of the respondents of Data Set 2. P denotes the Monte-Carlo -estimated exact p-value of Pearson's chi-square test and uc the uncertainty coefficient with activity (dependent). Only the significant results using 5 % risk level are presented.

Table 25. The multiway crosstabulation revealing the distributions of the first, second and third mentioned motives of the nature visitors of Data Set 2 who have mentioned their motives in order of preference. The n numbers are counts. Eight of the most important motives have been taken into account.

First motive	Second motive		Third motive, n							
		n	Fr	Pt	Bs	Pa	Ae	Ps	To	Gp
Freedom (Fr), n=22	Physical training (Pt),	6			4		1			1
	Beautiful scenery (Bs),	4				1			2	1
	Peace and silence (Ps)	4			1	1			3	
	To avoid everydayness (Ae)	3			1				1	1
	Plants and animals (Pa)	2						1		1
	Togetherness (To)	1					1			
	To get "prey" (Gp)	1						1		
Physical training (Pt), n=25	Beautiful scenery (Bs)	11				1	4	6		
	Peace and silence (Ps)	6			2	2			1	1
	Plants and animals (Pa)	3						1		2
	To avoid everydayness (Ae)	3			2				1	
	Freedom (Fr)	1			1					
	Togetherness (To)	1								1
Beautiful Scenery (Bs), n=38	Peace and silence (Ps)	10	1	4		1	1		1	2
	Physical training (Pt)	9				2	3	1		3
	Plants and animals (Pa)	7	1					3	3	
	Freedom (Fr)	5		1		1	1	1	1	
	To avoid everydayness (Ae)	3				1			2	
	Togetherness (To)	3		2				1		
	To get "prey" (Gp)	1		1						
Plants and animals (Pa), n=11	Beautiful scenery (Bs)	5	2	1			1	1		
	To get "prey" (Gp)	3	1					1	1	
	Peace and silence (Ps)	2								2
	To avoid everydayness (Ae)	1						1		
To avoid everydayness (Ae), n=18	Togetherness	5	1	1	1			2		
	Beautiful scenery (Bs)	4		1		1			1	1
	Peace and silence (Ps)	3		1	2					
	To get "prey" (Gp)	3		1				1		
	Freedom (Fr)	1							1	
	Physical training (Pt)	1								1
	Plants and animals (Pa)	1							1	
Peace and silence (Ps), n=53	Beautiful scenery (Bs)	16	3	4		3	2		2	2
	Freedom (Fr)	12		4	4	1	2			1
	Physical training (Pt)	8	1		2	1			1	3
	To avoid everydayness (Ae)	6	1	2	1	1				1
	Plants and animals (Pa)	4		1	2				1	
	Togetherness (To)	4			2	2				
	To get "prey" (Gp)	3	2		1					
Togetherness (To), n=20	Peace and silence (Ps)	6			4		1			1
	Beautiful scenery (Bs)	5		2			2	1		
	Physical training (Pt)	4	1		1		1			1
	To avoid everydayness (Ae)	3	1		1	1				
	Freedom (Fr)	1					1			
	To get "prey" (Gp)	1			1					
To get "prey" (Gp), n=28	Physical training (Pt)	8	2				2	3	1	
	Togetherness (To)	5		1	1		2	1		
	Beautiful scenery (Bs)	4	1				1	2		
	Plants and animals (Pa)	4		1	3					
	To avoid everydayness (Ae)	3		2	1					
	Peace and silence (Ps)	3	1		1	1				
	Freedom (Fr)	1						1		
Total		214	19	30	39	21	26	29	24	26

and, particularly, the biases in the sample of Data Set 2, the typologies should be read with cautions. The *motive* groups are the following:

Freedom: There are so few respondents whose primary motive to visit in nature is freedom that the following characterization is not statistically reliable. Thus the typology is only a suggestive one. A respondent who wants to experience freedom may be male rather than female, young and fairly highly educated. He may live, or has spent his childhood in some other parts of the country than western Finland. Physical training, beautiful scenery and the experience of peace and silence are the three most important secondary motives, and beautiful scenery and togetherness the most important third motives.

Table 26. The multiway crosstabulation revealing the distributions of the first, second and third mentioned activities of the nature visitors of Data Set 2 who have mentioned the activities in order of preference. The n numbers are counts.

First activity	Second activity		Third activity, n					
		n	Jwt	Ht	Hf	Bm	Pp	Oap
Jogging, walking and track skiing (Jwt), n=91	Picking berries or mushrooms (Bm)	46		13	11		3	19
	Hiking and trekking (Ht)	27			5	19	1	2
	Hunting or fishing (Hf)	7		1		4	1	1
	Observing wild animals or plants (Oap)	6	1	2		3		
	Photographing or painting (Pp)	2			1	1		
Hiking and trekking (Ht), n=45	Picking berries or mushrooms (Bm)	15	5		3			7
	Jogging, walking or track skiing (Jwt)	9			1	6		2
	Observing wild animals or plants (Oap)	6	1		2	3		
	Hunting or fishing (Hf)	6	2			3		1
	Photographing or painting (Pp)	3				2		1
Hunting or fishing (Hf), n=55	Picking berries or mushrooms (Bm)	30	4	14			1	11
	Hiking and trekking (Ht)	13	3			7	1	2
	Observing wild animals or plants (Oap)	5	2	2		1		
	Jogging, walking or track skiing (Jwt)	3				3		
	Photographing or painting (Pp)	2		1				1
Picking berries or mushrooms (Bm), n=71	Jogging, walking or track skiing (Jwt)	26		16	4			6
	Hiking and trekking (Ht)	18	12					6
	Observing wild animals or plants (Oap)	16	6	6	2		2	
	Hunting or fishing (Hf)	4	4					
	Photographing or painting (Pp)	3	1	1				1
Photographing or painting (Pp), n=6	Hunting or fishing (Hf)	1		1				
	Hiking and trekking (Ht)	1	1					
	Picking berries or mushrooms (Bm)	1			1			
	Observing wild animals or plants (Oap)	1		1				
Observing wild animals or plants (Oap), n=24	Picking berries or mushrooms (Bm)	8	2	2	3		1	
	Hiking and trekking (Ht)	6	3		2	1		
	Photographing or painting (Pp)	4		2		2		
	Hunting or fishing (Hf)	3		1		2		
	Jogging, walking or track skiing (Jwt)	2			1	1		
Total		274	47	63	36	58	10	60

Physical training: This motive is more important to females, older and lower educated persons having not spent their childhood in southern Finland but nowadays are living particularly in the administrative district of Uusimaa. Education and age are the most reliable variables to explain the differences between the groups of the respondents; it is more than four times evident to a primary school educated person to seek primarily physical training compared with a high school graduate. Furthermore, the group of the oldest respondents seeks primarily physical training about three times more often than the young and middle-aged respondents. Beautiful scenery, the experience of peace and silence and escape from everydayness are the most important second or third motives for the respondents belonging to this motivation group.

Beautiful scenery is more important for middle aged or older respondents than for the respondents belonging to the youngest group. City dwellers and those persons who are living in, or who have spent their childhood in the southern or eastern parts of the country, seek nature's beauty more often than the respondents belonging to the reference groups do. The logistic regression model reveals that city dwellers primarily seek beautiful scenery

Table 27. The analysis table of the logistic regression model between the primary motives of the nature visits of the respondents of Data Set 2 and the variables describing the background of the respondents. Only the statistically signigicant terms and parameter estimates have been presented using 5 % risk level.

Model design	Term in the model	Wald p	Group(s)	Reference group(s)	Exp (B)	R2	c-sta	H&L p
Pt=Age+Edu+Co	Age	.033	40 or younger	60 or older	0.31	.118	.702	.996
			41–59 years	60 or older	0.34			
	Edu	.018	Primary school	High school graduate	4.38			
Bs=Envres+Regresch+Co	Envres	.012	City	Countryside	2.95	.163	.740	.157
			Village	City	0.30			
	Regresch	.004	Southern	Northern	5.83			
			Eastern	Northern	5.00			
Ae=Regres+Co	Regres	.016	Western	Southern	13.95	.111	.716	–
Ps=Edu+Co	Edu	.005	High school graduate	Primary school	4.43	.063	.627	–
			Junior high school	Primary school	2.60			
Gp=Sex+Envres+Co	Sex	.042	Male	Female	2.38	.085	.664	.917
	Envres	.020	Countryside	City	2.87			

The symbols of the independent variables are: Sex, Age=Classified age, Edu=Education, Envres=Environment of residence, Regres=Geographical region of residence, Regresch=Geographical region of residence during childhood, Co=constant. The symbols of the dependent variables are: Pt = Physical training, Bs=Beautiful sceneries, Ae=To avoid everydayness, Ps = Peace and silence, Gp= To get prey. The abbreviations in the columns: P-value of Wald's test for the term (Wald p), Odds ratio (Exp(B)), Nagelkerke's R-squared (R2), c-statistics (c-sta) and the p-value of Hosmer & Lemeshow's goodness of fit test (H&L p).

about three times more often than the village or countryside dwellers do. Furthermore, those respondents who live in southern or eastern Finland seek beautiful scenery about five times more often than the respondents living in the northern part of the country do. The coefficients of the logistic regression model may not, however, be very reliable, because there is a slight interaction between the independent variables. Especially, the city dwellers of northern Finland may not emphasize beautiful scenery as much as the respondents who live in the other parts of the country. The interaction term is not, however, included in the model because of very sparse frequencies in most of the cells of the frequency table. The experience of peace and silence, physical training as well as seeing plants and animals are the three most important second motives to scenery seekers.

The experience of seeing plants and animals may be a little more important to the group of the youngest respondents as well as those who are living in villages or other small communities in northern or western Finland and who have spent their childhood in these parts of the country compared with the reference groups. Statistically significant differences cannot be pointed out. Seeing beautiful scenery is the most important second motive to these persons. The number of the respondents belonging to this motivation group is, however, too small for a reliable typology.

Table 28. The analysis table of the logistic regression model between the primary activitiess of the wilderness visits of the respondents of Data Set 2 and the variables describing the background of the respondents. Only the statistically signigicant terms and parameter estimates have been presented using 5 % risk level.

Model design	Term in the model	Wald p	Group(s)	Reference group(s)	Exp (B)	R2	c-sta	H&L p
Jwt=Regres+Co	Regres	.007	Southern	Northern	2.20	.056	.619	–
			Western	Southern	0.26			
Ht=Sex+Age+Co	Sex	.003	Male	Female	0.37	.098	.676	–
	Age	.044	40 or younger	60 or older	9.93			
Hf=Sex+Edu+Regres+Co	Sex	.000	Male	Female	23.38	.375	.845	.322
	Edu	.014	Junior high school	High school graduate	3.47			
			Primary school	High school graduate	3.73			
	Regres	.004	Northern	Southern	6.34			
			Western	Southern	3.99			
			Eastern	Northern	0.35			
Bm=Sex+Age+Co	Sex	.001	Male	Female	0.38	.098	.665	.993
	Age	.025	60 or older	40 or younger	2.70			
Oo=Envresch+Co	Envresch	.002	City	Countryside	5.76	.102	.701	–

The symbols of the independent variables are: Sex, Age=Classified age, Edu=Education, Envres=Environment of residence, Regres=Geographical region of residence, Regresch= Geographical region of residence during childhood, Co=constant. The symbols of the dependent variables are: Jwt=Jogging, walking and track skiing, Ht=Hiking and trekking, Ht=Hunting or fishing, Bm=Picking berries or mushrooms, Oo=Observing wild organisms. The abbreviations in the columns: P-value of Wald's test for the term (Wald p), Odds ratio (Exp(B)), Nagelkerke's R-squared, c-statistics (c-sta) and the p-value of Hosmer & Lemeshow's goodness of fit test.

To avoid (or escape) everydayness may be a little more important to the males than to females. Furthermore it may be more important to the young or middle-aged respondents and to those who live in the countryside, or especially in villages in western Finland, especially in the administrative districts of Turku and Pori compared with the reference groups. The respondents who live in North-Karelia and those who have spent their childhood in eastern Finland may feel it a little less important to visit nature for this reason than the respondents who are living, or have lived in the other parts of the country. The logistic regression model reveals that avoiding everydayness is about six times more important to western respondents compared with the respondents who live in southern Finland. The ratio between western and southern respondents is over ten times. Togetherness and beautiful scenery are the most important second motives to the respondents belonging to this motivation group.

The experience of peace and silence is a little more important to females and young respondents compared with males and older persons. Furthermore, the experience may be more important to the persons who are living, and who have spent their childhood in southern or western Finland than to the respondents of the reference groups. On the other hand, a big part of the respondents who are living in the administrative district of Mikkeli, in eastern Finland, seek this experience. The most reliable difference is found between the education groups. The results of the logistic regression models reveal that peace and silence is about four times more important to high school graduates and about two and half times more important to junior high school educated persons compared with the primary school educated respondents. Beautiful scenery and the experience of freedom are important to the respondents who want to experience peace and silence in nature.

The feeling of *togetherness* is important to nearly the same groups as the experience of peace and silence is. One difference, however, is that togetherness is obviously a little more important a motive to the respondents who live in eastern or northern Finland than to the persons who live in the southern or western parts of the country. These results are, however, suspicious. The experience of peace and silence and beautiful scenery are important to the seekers of togetherness as well.

Game, fish, berries, mushrooms or other *prey* are important mostly to the young or middle-aged, and not very highly educated men who live or have lived their lives in the countryside especially in the northern part of the country. Furthermore, the respondents of the western part of the country as well as those who live in North-Karelia may find it important to bring home some nature products. The logistic regression models reveal that prey is over two times more important to the men than to the women, and nearly three times more important to the countryside dwellers than to the respondents who live in the cities. Physical training is the most important second

motive to the respondents who belong to this motive group. Furthermore, many of them want to share the experiences with some other people.

Similarly to the motives, the *activities* will be characterized in the following by the groups of the respondents. Only the groups that differ significantly from each other have been taken into account.

Physical training like *jogging, walking or track skiing* may be a little more important to the females and to the rather old persons living in the centers than to the respondents belonging to the reference groups. Furthermore, those persons who are working in service, administrative, office, social and health care as well as in scientific or technical occupations may be a little more interested in these activities than the members of the other occupation groups. It is noticeable that the respondents who have lived their childhood in the administrative districts of Turku and Pori, Kymi or, particularly, in North-Karelia obviously do not emphasize these activities. A logistic regression model reveals that the respondents who are living in the southern part of the country have found this primary activity about two times more important than the respondents of the northern part of the country have and nearly four times more important than the western inhabitants. Picking berries and edible mushrooms as well as hiking and trekking are the most important second motives. In addition to the latter mentioned activities, the most important third activities are hunting, fishing and observing wild organisms. The experience of peace and silence, physical exercise and togetherness are the most important motives behind this activity.

Hiking and trekking is more important to the young or middle-aged, rather highly educated women belonging to white-collar employees or students representing particularly administrative, office, health care or social occupations and living in other districts than eastern Finland compared with the members of the reference groups. This activity is over two times more important to the females than to the males, and nearly ten times more important to the forty years old or younger than sixty years old or older respondents according to the logistic regression models. The farmers and the respondents who have spent their childhood in North-Karelia, Kuopio or Middle-Finland are apparently not very interested in hiking and trekking. Besides hiking and trekking, picking berries or mushrooms as well as observing wild organisms are important to hikers as well. The experience of peace and silence is clearly the most important motive attracting hikers to their trips.

A respondent whose main interest in nature is *hunting or fishing,* is typically a young or middle-aged man with a rather low education level who has lived during his childhood in a little village or in the countryside, but not in the administrative districts of Uusimaa, Kymi, Mikkeli or Middle-Finland. He belongs mostly to workers or farmers or the other entrepreneurs. The most evident is to find a hunter or a fisherman among the respondents who work in industry. The results of a logistic regression model reveals that the

males are about twenty times more often hunters compared with the women. The respondents living in the north are over six times, and the western ones about four times, more often hunters than the southern respondents are. Furthermore, among the northern respondents, one may find about three times more hunters or fishermen than among the eastern respondents. Among primary school or junior high school educated respondents, there are about three and half times more persons whose main activity in nature is hunting or fishing compared with the high school graduate respondents. In addition to hunting or fishing, a hunter or fisherman is often interested in berry picking or collecting mushrooms as well as hiking and trekking or observing wild organisms in nature. Although many other motives, as well as peace and silence are important to hunters and fishermen, they find it important to get game and fish as well.

A respondent who is particularly interested in *collecting berries or edible mushrooms* is typically a rather old female. A rather reliable logistic regression model reveals that one may find a keen berry or mushroom picker nearly three times more often among the rather old females compared with the reference sex and age groups. Furthermore, Figure 41 suggests that during her childhood, the berry or mushroom picker has obviously not lived in the administrative districts of Häme, Mikkeli or Oulu. Moreover, it is not evident that these berry or mushroom picking respondents belong to the students or workers, especially those who are working in traffic or transportation compared with the reference groups. The persons belonging to this activity group are often interested in physical training like jogging, walking or track skiing, and some of them, hiking or trekking as well. Although, getting berries or mushrooms is an important motive to these respondents, the experience of peace and silence or beautiful scenery are important motives to berry or mushroom pickers as well.

Few respondents mentioned that their main interest is *painting or photographing nature*. For that reason one should be careful in characterizing these respondents. The results suggest that the painters or photographers are merely rather young city-dwellers who have rather high education. This person is perhaps a student. Among the respondents of Data Set 2, the respondents of North-Karelia are about forty times more often photographers or picture painters than the respondents who lives in Lapland. Paintings or photographs are the most important motives to this little group of the respondents.

The results suggest that a person whose main interest is to *observe wildlife* in nature is obviously more often a male than a female, and in addition, he is a rather young and highly educated city dweller. Many of these persons among the respondents have spent their childhood in the administrative districts of Turku and Pori, Häme or Mikkeli and belong to the higher white-collar employees and are working especially in scientific or technical occupations. A logistic regression model reveals that a nature observation

enthusiast has spent his, or her, childhood nearly six times more often in a city than in the countryside. Many of these people pick berries or mushrooms, or are interested in hiking and trekking as well. Furthermore, it is evident that besides seeing the animals or plants, these respondents want to experience first of all peace and silence in nature. The sample is, however, too small to make a reliable characterization.

The Nagelkerke's R-squared values are rather small telling that the logistic regression models do not explain very much about the selection of the primary motives or activities. Furthermore, the values of c-statistics are from about 0.62 to 0.85 telling that the classification efficiency of the models is rather low in many cases. The model for hunting or fishing is the most effective model. The results of Hosmer's and Lemeshow's measures for the fit of the models are good enough. The models, except the model for hunting or fishing and the model for the motive of beautiful scenery, fit reasonable well. The latter mentioned statistics cannot, however, be calculated reliably for all of the models. (Tables 27 and 28).

6.2.2 Outdoor recreation in the Finnish wilderness, some features, motives and activities

This section consists mainly of the results of Data Set 1. Because the sample method of the data set is a partitioned random sample of the Finnish population, the results describe the real habits of wilderness recreation of the Finnish population rather well, the results being more reliable than in Data Set 2. The partitioning in Data Set 1 causes, however, some biases and makes somewhat unreliable generalizations (Fig. 5).

Most of the Finnish respondents have *experienced wilderness*: 59% of the respondents of Data Set 1 and about 74% of the respondents of Data Set 2 have visited an area that they consider as wilderness. It has to be emphasized that in most cases the experience has been found outside our statutory wilderness areas. Any statistically significant differences at a 5% risk level between the groups of the respondents of Data Set 2 have not been found testing the differences using Pearson's or log-likelihood chi-square tests. There is, however, a great variation among the groups of the respondents in Data Set 1 in visiting wilderness.

The male respondents are keener wilderness visitors than the females. Furthermore, there is a linear trend in wilderness experience with higher education. In addition, the respondents of northern Finland have experienced wilderness more often than those who are living in other parts of the country. Most of the white-collar employees, especially higher white-collar employees as well as students and entrepreneurs have visited wilderness but a great deal of farmers or home-makers have not (Table 29). A logistic regression model with independent variables of sex, education and environment of residence reveals that among men there are about two times more

Table 29. The wilderness experience of the respondents of Data Set 1 by the groups of the respondents. Only the grouping variables with statistically significant differences using 5 % risk level have been taken into account.

Grouping variable	Group	n	Wilderness experience, % of the respondents		P-values of chi-square, log-likelihood (in parenthesis) and linear-by linear association (in Italic) tests	
			Has	Has not		
Sex	Male	454	68.3	31.7	.000	(.000)
	Female	409	48.9	51.1		
Education	Primary school	285	51.9	48.1	.008	(.008)
	Junior high school	364	61.5	38.5	*.003*	
	High school graduate	207	64.7	35.3		
Geographical region of residence	Southern	228	56.1	43.9	.000	(.000)
	Western	181	49.7	50.3		
	Eastern	229	52.8	47.2		
	Northern	227	75.3	24.7		
Administrative district of residence	Uusimaa	120	55.8	44.2	.000	(.000)
	Turku and Pori	119	50.4	49.6		
	Häme	73	52.1	47.9		
	Kymi	73	45.2	54.8		
	Mikkeli	47	57.4	42.6		
	North-Karelia	47	57.4	42.6		
	Kuopio	62	54.8	45.2		
	Central-Finland	34	67.6	32.4		
	Vaasa	63	47.6	52.4		
	Oulu	159	77.4	22.6		
	Lapland	68	70.5	29.4		
Geographical region of residence during childhood	Southern	178	57.9	42.1	.000	(.000)
	Western	170	46.5	53.5		
	Eastern	226	56.2	43.8		
	Northern	212	74.5	25.5		
Administrative district of residence during childhood	Uusimaa	78	52.6	47.4	.001	(.001)
	Turku and Pori	101	43.6	56.4		
	Häme	65	55.4	44.6		
	Kymi	65	52.3	47.7		
	Mikkeli	46	60.9	39.1		
	North-Karelia	53	58.5	41.5		
	Kuopio	63	55.6	44.4		
	Central-Finland	36	75.0	25.0		
	Vaasa	67	50.7	49.3		
	Oulu	161	73.9	26.1		
	Lapland	52	76.9	23.1		
Socioeconomic status	Upper white-collar	102	72.5	27.5	.001	(.001)
	Lower white-collar	204	60.3	39.7		
	Blue-collar	259	55.2	44.8		
	Farmer	75	49.3	50.7		
	Entrepreneur	67	64.2	35.8		
	Student	81	65.4	34.6		
	Home-maker	37	35.1	64.9		

wilderness-experienced persons. The proportion of the wilderness visitors increases about from 1.5 to nearly two times with changing base education level from primary school educated to junior high school educated or to high school graduates. Furthermore, it is over two times more likely to find a wilderness visitor among those who live in Northern Finland compared with the respondents living in the other parts of the country. The logistic regression model fits the data quite well, but the classification efficiency of the model is not very high (Table 30).

Most of the wilderness visits are rather short; typical visits of the respondents of Data Set 1 have been from two to ten hours. However, about half of the respondents usually visit wilderness (or wilderness-like environments) for one day and night or longer during their visits. Furthermore, only a little less than 5 % of the respondents usually stay seven days and nights or more in wilderness at a time (Fig. 42). The results of the cross-tabulations between the wilderness visits and the groups of the respondents in Table 31 reveal the differences between the groups of the respondents in their typical wilderness visits.

According to the cross-tabulations, it is evident that the males usually make longer (three days and nights or longer) visits than the female do (Table 31). The same can be said about the young or the middle-aged, as well as the rather highly educated respondents compared with the oldest and/or the lowest educated group of the respondents. Statistically significant trends between the decreasing education as well as growing age and the decreasing

Table 30 . The analysis table of the logistic regression models between the wilderness experience of the respondents of Data Set 1 and the variables describing the background of the respondents. Only the statistically significant terms and parameter estimates have been presented using 5 % risk level. The reference category of the dependent variable is "Has not had the wilderness experience".

Model design	Term in the model	Wald p	Group(s)	Reference group(s)	Exp (B)	R2	c-sta	H&L p
Wilderness	Sex	.000	Male	Female	2.31	.123	.677	.983
experience=	Edu	.010	Junior high school	Primary school	1.41			
Sex+Edu+			High school graduate	Primary chool	1.80			
Regres+Co	Regres	.000	Southern	Northern	0.39			
			Western	Northern	0.32			
			Eastern	Northren	0.35			

The symbols of the independent variables are the following: Edu=Education, Regres=Geographical region of residence. The abbreviations in the columns are the following: P-value of Wald's test (Wald p), Odds ratio (Exp(B)), Nagelkerke's R-squared, c-statistics (c-sta) and the p-value of Hosmer & Lemeshow's goodness of fit test.

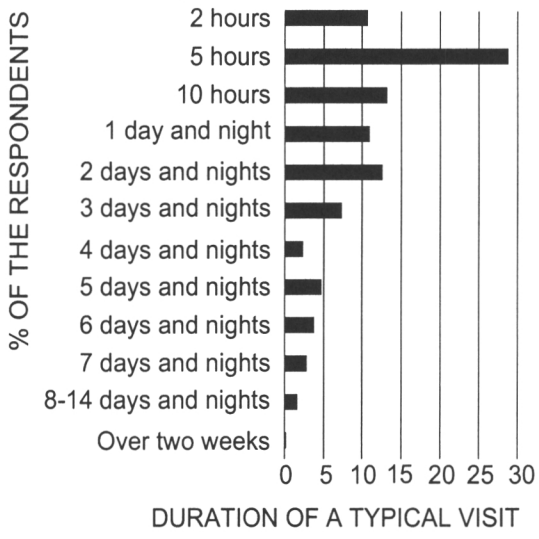


Fig. 42. The duration of a typical wilderness visit of the respondents of Data Set 1 (n=418).

Table 31. The duration of typical wilderness visits of the respondents of Data Set 1 by the groups of the respondents. Only statistically significant differences using 5 % risk level are presented. Day visits denotes the visits of 2 to 10 hours, weekend visits the visits of 1 to 2 days and nights and longer visits the visits that are longer than weekend visits.

Grouping variable	**Groups**	**n**	**% of the respondents**			**The p-values of Pearson's, log-likelihood (in parenthesis) chi-square tests and linear-by linear association (in Italic)**	**Uncertainty coefficient**
			Day visits	**Weekend visits**	**Longer visits**		
Sex	Male	281	47.3	25.3	27.4	.000 (.000)	.022
	Female	190	66.3	21.1	12.6		
Age (years)	40 or less	232	49.6	29.3	25.1	.004 (.003)	.017
	41–59	171	56.7	17.0	26.3	*.030*	
	60 or more	66	68.2	21.2	10.6		
Education	Primary school	133	66.9	18.8	14.3	.006 (.006)	.016
	Junior high school	223	49.3	28.3	22.4	*.004*	
	High school graduate	110	51.8	20.0	28.2		
Environment of residence	City	204	46.6	25.5	27.9	.004 (.004)	.016
	Village	134	64.2	17.9	17.9	*.003*	
	Countryside	135	58.5	26.7	14.8		
Environment of residence during child-hood	City	117	45.3	23.1	31.6	.009 (.010)	.014
	Village	75	58.7	29.3	12.0	*.011*	
	Countryside	274	58.4	22.3	19.3		

length of a typical visit is obvious. Furthermore, the urban dwellers usually make longer trips in wilderness compared with the rural ones. A positive trend between increasing urbanity and the length of the visit has been found. The uncertainty coefficients of the cross-tabulations remain somewhat low telling about a rather low explanation rate between the dependent and the independent variables. The coefficients are, however, statistically significant under a 5% risk level telling that the explained proportion is not due to the sampling error.

Furthermore, the logistic regression model (Table 32) reveals that the best predictors that would characterize the person of long wilderness visits, lasting at least three days, are a person's gender as well as the environment of his or her residence at this moment and during person's childhood. It is nearly three times more likely to find a man compared with a woman, who visits wilderness at least three days at a time. Similarly, among the wilderness visitors who live, or have lived during their childhood, in the cities, there are from two to three times more long distance hikers compared with the village or countryside dwellers.

The respondents of Data Set 1 were also asked whether they stay *overnight in wilderness* and if they stay, what is the best accommodation that they would prefer to use. It became evident that a little more than one-fourth of the visitors do not stay overnight in wilderness or wilderness-like environments. About a third of the them prefer outdoor accommodation in a tent or an open wind and rain shelter called *laavu* or *loude*. The same proportion want to spend their wilderness nights indoors, in a hut for common use or in a hut for rent. From the three respondents who could not accept any of the ready-made alternatives, one respondent expressed his or her wish to stay overnight in a boat and one wants to stay the night in his or her own cabin (Fig. 43).

Table 32. The analysis table of the logistic regression models revealing a typical long distance wilderness hiker's (makes the wilderness visits of three days or more) background. Only the statistically significant terms and parameter estimates have been presented using 5 % risk level.

Model design	Term in the model	Wald p	Group(s)	Reference group(s)	Exp (B)	R2	c-sta	H&L p
Lv=Sex+Envres+	Sex	.000	Male	Female	2.73	.108	.689	.736
Envresch+Co	Envres	.029	City	Countryside	2.21			
	Envresch	.038	City	Village	2.86			

The symbols of the independent variables are: Sex, Envres=Environment of residence, Envresch=Environment of residence during childhood. Co=Constant The dependent variable is called Long visits (Lv). It has been coded as 1=makes the long visitss, 0= makes not the visits. The abbreviations in the columns: P-value of Wald's test for the term (Wald p), Odds ratio (Exp(B)), Nagelkerke's R-squared, c-statistics (c-sta) and the p-value of Hosmer & Lemeshow's goodness of fit test.

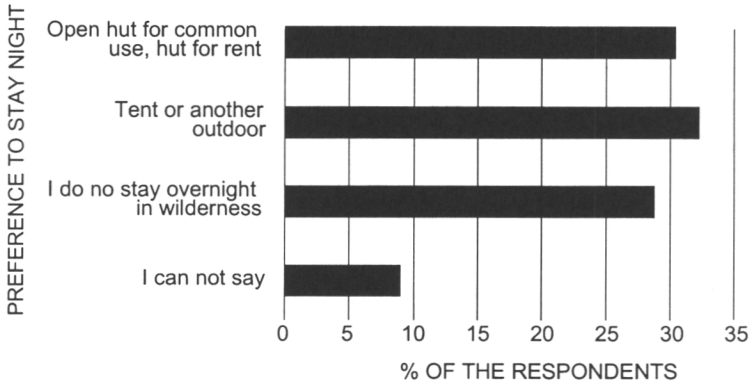


Fig. 43. The preference of the respondents of Data Set 1 to stay overnight in wilderness, n=489.

Some differences between the groups of the respondents can be found in their wish to stay overnight in nature or wilderness (Table 33). The females, the older persons as well as the lower educated persons are the most reluctant groups to spend their nights in wilderness compared with the reference groups. The same can be said about the farmers and the other entrepreneurs as well as about the home-makers. On the other hand, a typical person who wants to experience the night in wilderness is a middle-aged, rather well educated male belonging to workers or especially to students. Furthermore, Table 33 reveals that there are not so much differences in the preferences of the different groups to stay the night indoors; the differences are more dramatic in the wishes to stay overnight outdoors or not stay the night in wilderness at all.

Similarly to Data Set 2, the respondents of Data Set 1 were also asked for their *motives* to visit wilderness areas and the *activities* they usually undertake during their wilderness visits. The alternatives were rather similar compared with Questionnaire 2 (Data Set 2). There were, however, fewer alternatives to choose in this questionnaire. Perhaps the biggest difference was the absence of the alternative "jogging, walking or track skiing" among the alternatives of the question in Questionnaire 1 (Data Set 1).

Many similarities between the two questionnaires can be found in the activities. The experience of peace and silence as well as the special experiences like seeing beautiful scenery, are both very important to wilderness and nature visitors. If we add the scores of the alternatives, such as beautiful scenery, to see plants and animals as well as to stay overnight in wilderness and name the group as the "special experiences", as it has been done in Questionnaire 1, we see that this motive group is the most important to the

Table 33. The preferences of the respondents of Data Set 1 to stay over night in wilderness by the groups of the respondents. Only statistically significant differences using 5 % risk level are presented. The respondents who have answered "I cannot say" have been omitted.

Grouping variable	Groups	n	Preference to stay overnight, % of the respondents			The p-values of Pearson's chi-square tests and linear-by linear association (in Italic)	Uncertainty coefficient
			Tent or other outdoor accommodation	Open hut, cabin for rent	Do not stay overnight		
Sex	Male	264	*41.3*	*33.0*	*25.8*	.001 (.001)	.014
	Female	179	*26.3*	*34.1*	*39.7*		
Age (years)	40 or less	220	*43.2*	*32.3*	*24.5*	.000 (.000)	.023
	41–59	163	*30.1*	*37.4*	*32.5*	*.000*	
	60 or more	58	*19.0*	*27.6*	*53.4*		
Education	Primary school	128	*27.3*	*28.1*	*44.5*	.004 (.005)	.015
	Junior high school	211	*39.3*	*36.0*	*24.6*	*.019*	
	High school graduate	101	*35.6*	*34.7*	*29.7*		
Socioeconomic status	Upper white-collar	51	*37.3*	*33.3*	*29.4*	.032 (.030)	.025
	Lower white-collar	112	*28.6*	*36.6*	*34.8*		
	Blue-collar	138	*44.9*	*30.4*	*24.6*		
	Farmer	32	*21.9*	*34.4*	*43.8*		
	Entrepreneur	33	*24.2*	*27.3*	*48.5*		
	Student	45	*46.7*	*35.6*	*17.8*		
	Home-maker	12	*33.3*	*16.7*	*50.0*		

nature visitors and the second most important to the wilderness visitors (Figures 38 and 44). Physical training is important to many of the wilderness visitors, but it is evident that it is not as important to the wilderness visitors as it is to the nature visitors. On the other hand, togetherness may be even more important to the wilderness visitors than to the nature visitors. Getting prey (game, berries, wild mushrooms and so on) has been ranked rather similarly: it is the fourth most important motive in the results of the both data sets. Freedom was not mentioned among the ready-made alternatives in Questionnaire 1. This may be one reason why none of the respondents of Questionnaire 1 have mentioned this motive! Testing oneself, experiencing solitude, facing adventures and having experiences with the purpose to tell them to other people are important reasons only to the minority of the respondents of both data sets.

Figure 45 reveals the interaction between the primary activities and the motives. The pattern is rather similar to that of nature visitors as well (Fig. 39). The experience of peace and silence may be a little more important to

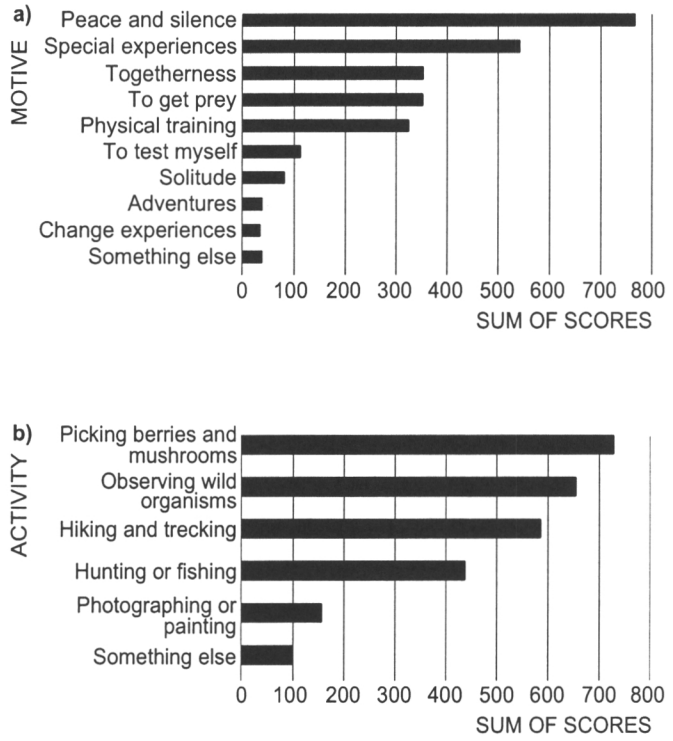


Fig. 44. The scores of the motives (a) and activities (b) of the wilderness visits of the respondents of Data Set 1. The scores have been computed as a sum of points (scores) when the first important motive or activity has been given three points, the second important 2 points and the third important 1 point.

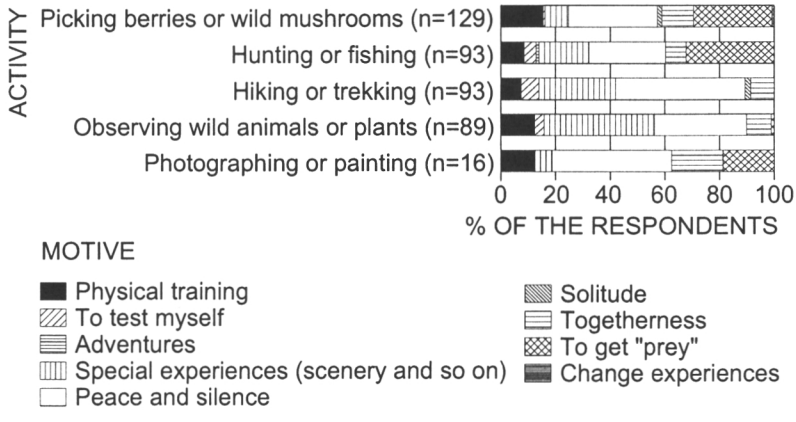


Fig. 45. The interrelationship between the primary motives and primary activities of wilderness visits of the respondents of Data Set 1. Pearson's chi-tests Monte-Carlo -estimated exact p=0.000. The value of the uncertainty coefficient with motive (dependent) is 0.095. The Monte-Carlo -estimated p-value of the coefficient is 0.000.

wilderness hunters than to the hunters in general. Furthermore, those persons who pick berries or mushrooms in wilderness, may find it a little more important to obtain some physical exercise compared with those who collect their berries and mushrooms in the 'ordinary' nature. On the other hand, the berry and mushroom pickers belonging to the latter mentioned group may appreciate scenery more than those belonging to the first mentioned group.

The effect of the background of the respondents of Data Set 1 on their *motives* to visit wilderness has been studied in a similar way to Data Set 2. The aim of the study has been to characterize the typical features of the respondents who belong to certain motivation groups. Following are the characterizations of the motives based on Figure 46 and Tables 34 and 36.

Physical training: Similar to the results of Questionnaire 2, physical training is more important to the older and, particularly, to the lower educated

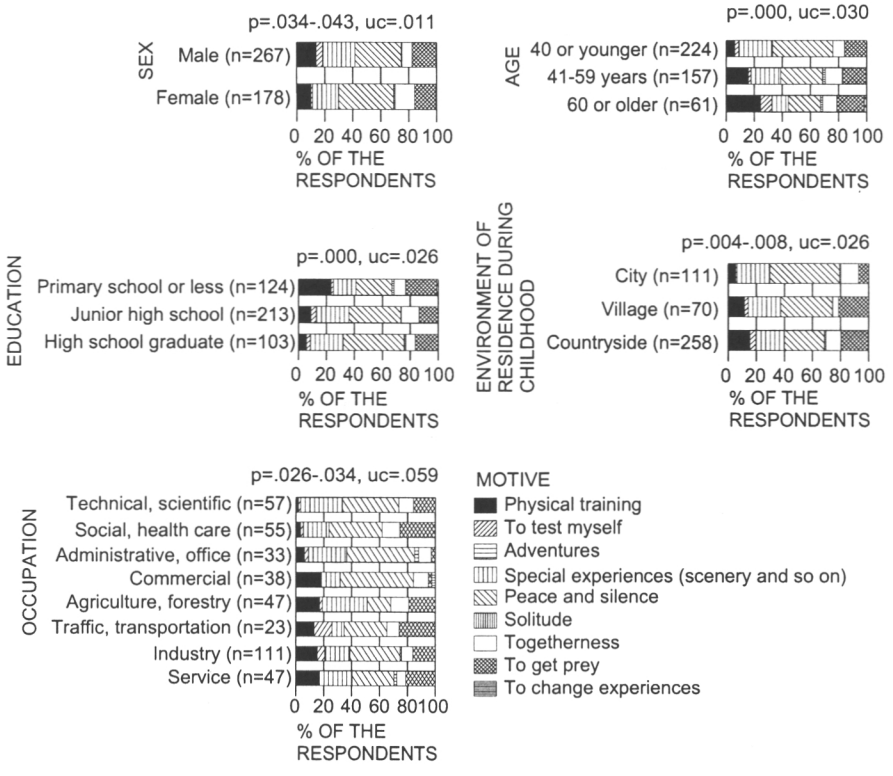


Fig. 46. The distribution of the primary motives by the groups of respondents of Data Set 1. P denotes the Monte-Carlo -estimated exact p-value of Pearson's chi-square test and uc the uncertainty coefficient with motive (dependent). Only the significant results using 5 % risk level are presented.

persons. It is about three times more evident to a primary school educated person, and about two times more evident to a junior high school educated respondent to seek primarily physical training in wilderness compared with a high school graduate. The coefficients for the youngest and the oldest age group are similar to the coefficient between the lowest and the highest education groups. Furthermore, it is evident that the motive of physical training in wilderness has a decreasing importance with a growing level of urbanization. The effect of age and education may, however, affect the latter mentioned difference. The experience of peace and silence is the most important second motive, and togetherness the most often mentioned third motive by the respondents belonging to this motivation group.

Table 34. The multiway crosstabulation revealing the distributions of the first, second and third mentioned motives of the wilderness visitors of Data Set 1 who have mentioned their motives in order of preference. The n numbers are counts. Six of the most important motives have been taken into account.

First motive	Second motive		Third motive, n					
		n	Pt	Tm	Bs	Ps	To	Gp
Physical training (Pt), n=35	Peace and silence (Ps)	14		2	1		5	6
	To test myself (Tm)	7			1	3		3
	To get "prey" (Gp)	6			3	1	2	
	Beautiful scenery, special experiences (Bs)	5				4	1	
	Togetherness (To)	3			1		2	
To test myself (Tm), n=11	Beautiful scenery, special experiences (Bs)	5				2		3
	Togetherness (To)	2					2	
	To get "prey" (Gp)	2				2		
	Physical training (Pt)	1			1			
	Peace and silence (Ps)	1					1	
Beautiful scenery, special experieces (Bs), n=71	Peace and silence (Ps)	41	9	5			20	7
	Togetherness (To)	11	2	1		3	5	
	Physical training (Pt)	8		1		4	3	
	To get "prey" (Gp)	8	2			3	3	
	To test myself (Tm)	3	1			1	1	
Peace and silence (Ps), n=106	Beautiful scenery, special experiences (Bs)	37	6	7			17	7
	Togetherness (To)	35	9	2	18			6
	Physical training (Pt)	17		2	6		2	7
	To get "prey" (Gp)	13	3		5		5	
	To test myself (Tm)	4	1		1		1	1
Togetherness (To), n=34	Peace and silence (Ps)	14	5	1	7			1
	Beautiful scenery, special experiences (Bs)	12	3	2	6			1
	To get "prey" (Gp)	4	1		1	2		
	Physical training (Pt)	3			1	1		1
	To test myself (Tm)	1	1					
To get "prey" (Gp), n=52	Peace and silence (Ps)	22	6		11		5	
	Beautiful scenery, special experiences (Bs)	12	3	3		4	2	
	Togetherness (To)	10	3		2	5		
	Physical training (Pt)	7				5	2	
	To test myself (Tm)	1	1					
Total		309	56	26	65	40	79	43

Testing oneself in wilderness is not the primary motive for very many wilderness visitors. Thus, the statistically significant differences are hard to find. However, there is some evidence that this motive is more important to the males and to those respondents who live in the countryside than to the females or the city dwellers. The bigger proportion of the respondents who work in traffic and transportation have found testing themselves to be more important compared with the respondents working in the other occupations. To see beautiful scenery, wild animals or plants or experience the night in wilderness is the most often mentioned second motive.

Figure 46 suggest that *special experiences,* such as beautiful scenery, seeing plants and animals or the experience of staying overnight in wilderness are perhaps more important for the young respondents than the older persons. Despite of the differences in Figure 46, the difference between the groups is not, however, statistically significant under a 5 % risk level when the differences have been tested from one motive to another. Similarly, there may be some, but not statistically significant, evidence that some occupation groups, such as commercial, industrial and, especially, transportation workers do not emphasize this motive as much as the respondents who are working in the technical or scientific occupations or in agriculture or forestry. The experience of peace and silence is clearly the most often mentioned second motive and togetherness the most often mentioned third motive by the respondents belonging to this motivation group.

Peace and silence is the most important motive of the wilderness visitors. This experience is about three times more important to the 40 years old and younger persons compared with the 60 years old or older persons. Comparing the middle-aged respondents with the first mentioned age group, it becomes evident that the experience of peace and silence is nearly two times more important to the youngest group. Furthermore, the importance of this experience is closely related to increasing education. The respondents who work in agriculture and forestry do not appreciate peace and silence as much as the persons belonging to the other occupation groups. Besides age, the environment of the respondent's residence during his or her childhood is a rather strong predictor of the importance of this motive. Those who have grown up in the cities mention the motive over two times more often than countryside dwellers. Beautiful scenery or other special experiences and the experience of togetherness have been mentioned most often as the second and third most important motives.

To get prey, such as game, berries, mushrooms and so on, is about three times more important to those who have spent their childhood in the countryside, and three and half times more important to the respondents who have grown up in villages than to those who have grown up in towns or cities. However, there are the certain occupation groups, such as administrative, office or commercial employees, who may appreciate this motive less than the persons belonging to the other occupation groups. The experience

of peace and silence is the most often mentioned second motive to those who aim to get prey.

Togetherness is about two times more important to females than to males. The logistic regression model with sex as the only dependent variable does not, however, explain the selection of this motive very well although the only statistically significant differences have been found between the males and females.

The characterizations of different *activity* groups are the following (see Figure 47 as well as Tables 35–37):

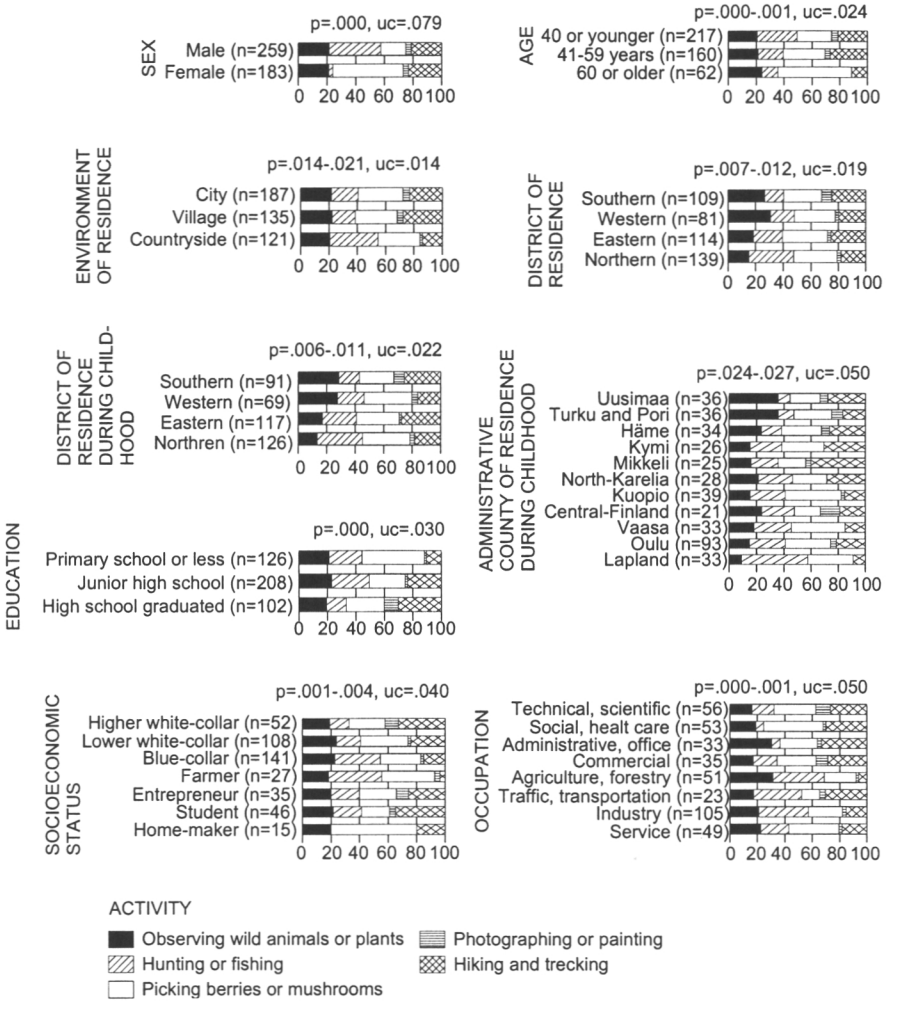


Fig. 47. The distribution of primary activities by the groups of the respondents of Data Set 1. P denotes the Monte-Carlo -estimated exact p-value of Pearson's chi-square test and uc the uncertainty coefficient with activity (dependent). Only the significant results using 5 % risk level are presented.

Table 35. The multiway crosstabulation revealing the distributions of the first, second and third mentioned activities of the nature visitors of Data Set 1 who have mentioned the activities in order of preference. The n numbers are counts.

First activity	Second activity		Third activity, n				
		n	Oap	Hf	Bm	Pp	Ht
Observing wild animals or plants (Oap), n=84	Picking berries or mushrooms (Bm)	40		4		8	28
	Hiking and trekking (Ht)	24	1	2	15	6	
	Hunting or fishing (Hf)	11			6	3	2
	Photographing or painting (Pp)	9			3		6
Hunting or fishing (Hf), n=86	Picking berries or mushrooms (Bm)	49	23			5	21
	Observing wild animals or plants (Oap)	22			10	3	9
	Hiking and trekking (Ht)	11	8		2	1	
	Photographing or painting (Pp)	4					4
Picking berries or mushrooms (Bm), n=103	Observing wild animals or plants (Oap)	43		5		3	35
	Hiking and trekking (Ht)	32	25	6		1	
	Hunting or fishing (Hf)	23	14				9
	Photographing or painting (Pp)	5	3				2
Photographing or painting (Pp), n=15	Observing wild animals or plants (Oap)	6			2		4
	Hiking and trekking (Ht)	5	3		2		
	Picking berries or mushrooms (Bm)	3	1	1			1
	Hunting or fishing (Hf)	1	1				
Hiking and trekking (Ht), n=82	Observing wild animals or plants (Oap)	42		6	24	12	
	Picking berries or mushrooms (Bm)	19	14	2		3	
	Hunting or fishing (Hf)	13	7		4	2	
	Photographing or painting (Pp)	8	2		6		
Total		370	102	26	74	47	121

Table 36. The analysis table of the logistic regression models between the primary motives of the wilderness visits of the respondents of Data Set 1 and the variables describing the background of the respondents. Only the statistically significant terms and parameter estimates have been presented using 5 % risk level.

Model design	Term in the model	Wald p	Group(s)	Reference group(s)	Exp (B)	R2	c-sta	H&L p
Pt=Age+Edu+Co	Age	.025	40 or younger	60 or older	0.31	.109	.706	.786
			41–50 years	60 or older	0.73			
	Edu	.046	High school graduate	Primary school	0.34			
			Junior high school	Primary school	0.49			
Ps=Age+Envresch+Co	Age	.014	40 or younger	60 or older	2.10	.073	.636	.997
			41–59 years	40 or younger	0.57			
	Envresch	.006	City	Countryside	2.17			
To=Sex+Co	Sex	.017	Male	Female	0.47	.027	.595	–
Gp=Envresch+Co	Envresch	.013	Countryside	City	3.01	.040	.593	–
			Village	City	3.54			

The symbols of the independent variables are: Sex, Age=Classified age, Edu=Education, Envresch=Environment of residence during childhood, Co=constant. The symbols of the dependent variables are: Pt=Physical training, Ps=Peace and silence, To=Togetherness, Gp=To get prey. The abbreviations in the columns: P-value of Wald's test for the term (Wald p), Odds ratio (Exp(B)), Nagelkerke's R-squared (R2), c-statistics (c-sta) and the p-value of Hosmer & Lemeshow's goodness of fit test (H&L p).

The primary activity of *observing wild organisms*, such as wild animals and plants, is important to the a fifth of the respondents. There are not very many differences between the groups of the respondents. The only statistically significant difference has been found between the respondent groups who grew up in different regions of the country. Among the respondents who grew up in the southern or western parts of the country, one may find nearly two and half times more the wilderness visitors whose main hobby is to observe wild organisms compared with the respondents who grew up in the northern part of the country. The greatest differences have been found between the administrative districts of Uusimaa, Turku and Pori (about 40 % of nature observers) and Lapland (about 10 %). Picking berries or mushrooms

Table 37. The analysis table of the logistic regression models between the primary activities of the wilderness visits of the respondents of Data Set 1 and the variables describing the background of the respondents. Only the statistically significant terms and parameter estimates have been presented using 5 % risk level.

Model design	Term in the model	Wald p	Group(s)	Reference group(s)	Exp (B)	R2	c-sta	H&L p
Oo=Regresch+Co	Regresch	.032	Southern	Northern	2.42	.034	.600	–
			Western	Northern	2.31			
Hf=Sex+Age+Edu+	Sex	.000	Male	Female	22.16	.384	.848	.432
Envres+Regres+Co	Age	.001	41–59 years	40 or younger	0.40			
			60 or older	40 or younger	0.20			
	Edu	.027	Junior high school	High school graduate	2.53			
			Primary school	High school graduate	2.97			
	Envres	.003	Village	Countryside	0.30			
	Regres	.013	Northern	Southern	3.09			
Bm=Sex+Age+	Sex	.000	Female	Male	5.22	.233	.754	.841
Edu+Co	Age	.012	40 or younger	60 or older	0.34			
			41–59 years	60 or older	0.39			
	Edu	.027	High school graduate	Primary school	0.50			
			Junior high school	Primary school	0.46			
Pp=Edu+Co	Edu	.004	Junior high school	High school graduate	0.18	.093	.706	–
			Primary school	High school graduate	0.16			
Ht=Age+Edu+	Age	.015	41–59 years	40 or younger	1.89	.102	.677	.656
Envres	Edu	.007	High school graduate	Primary school	3.68			
	Envres	.040	Village	Countryside	2.35			

The symbols of the independent variables are: Sex, Age=Classified age, Edu=Education, Envres=Environment of residence, Regres=Geographical region of residence, Regresch= Geographical region of residence during childhood, Co=constant. The symbols of the dependent variables are: Oo=Observing wild organisms, Ht=Hunting or fishing, Bm=Picking berries or mushrooms, Pp=Photographing or painting, Ht=Hiking and trekking. The abbreviations in the columns: P-value of Wald's test for the term (Wald p), Odds ratio (Exp(B)), Nagelkerke's R-squared, c-statistics (c-sta) and the p-value of Hosmer & Lemeshow's goodness of fit test.

is the most often mentioned second activity as well as hiking and trekking the most important third activity among the respondents belonging to this activity group. Besides the animals or scenery, these respondents want first of all to experience peace and silence in wilderness.

Hunting or fishing has clearly been an activity for the rather young and not very highly educated men. The males choose these activities over 20 times more often than the females. Among middle-aged respondents there are over two times, and among the at most forty years old respondents five times, more hunters or fishermen compared with the persons who are reaching their retirement. Furthermore, the junior high school educated persons mention hunting or fishing as their main activity about two and half times, and the primary school educated nearly three times, more often than the high school graduates. The respondents who are working in the female-dominated occupations, such as in the social, health care or administrative occupations, are not very interested in hunting or fishing, but those persons who are working in agriculture, forestry, transportation or industry are often interested in these activities. The latter mentioned occupations are usually dominated by men. Among countryside dwellers, these activities are about three times more popular than among the city or town dwellers. Furthermore, the region where a person lives, or has lived during his or her childhood, has an influence on hunting or fishing activity. In the northern part of the country, these activities are about three times more popular than in the southern part of the country. Hunters or fishermen have mentioned most often berries or mushroom picking as their second activity as well as observing wild organisms or hiking and trekking as their third activity. Besides fish and game, peace and silence as well as beautiful landscape are remarkably important for hunters and fishermen.

Picking wild berries or edible mushrooms is the most important activity to many rather old and lower educated women. The women choose this activity over five times more often than men. The respondents who are reaching, or have reached, the age of sixty years choose berry or mushroom picking from two to three times more often than the younger respondents do. Furthermore, one may find two times more berry or mushroom pickers among the primary school or less educated persons as compared with the higher educated ones. The effect of sex can be seen in the distributions between the different occupation groups. Thus, there are many more berry or mushroom pickers among the social or health care employees compared with traffic or transportation employees. It is remarkable that the differences between the different parts of the country are rather small. In many cases, the respondents who belong to this activity group are interested in hiking and trekking or observing animals or plants. Berries and mushrooms are not the only things to attract a person belonging to this activity group into wilderness: besides having these goods, enjoying togetherness and having some physical training, a berry or mushroom picker wants to experience peace and silence in wilderness.

There are not many respondents whose main activity during their wilderness visits is *photographing or painting*. Figure 47 reveals that there are certain differences between age classes and between different parts of the country as well as between occupation or socioeconomic groups. None of the respondents belonging to the oldest group has chosen these activities as their primary activities. In the southern part of the country there may be a few more nature painters or photographers than in the other parts of the country. And there may be a few more higher white-collar employees as well as technical, scientific or commercial employees interested in the arts during their wilderness visits compared with the reference groups. To prove these directions statistically would, however, need a bigger sample. Education is the only significant variable to explain the respondents' interest in photographing or painting. In addition, the classification efficiency of the variable is rather high. The logistic regression model reveals that among high school graduates, there are over five times more nature painters or photographers compared with the lower educated respondents. Observing wild animals or plants as well as hiking and trekking may be important to this group of respondents as well. The experience of peace and silence is perhaps even more important to wilderness artists than having pictures or paintings.

Hiking and trekking is the most often selected primary activity among the middle-aged respondents. Furthermore, a linear trend is clearly seen in the growing importance of this activity with increasing education. Among the middle-aged respondents there are about two times more hikers and trekkers compared with the younger persons. Figure 47 reveals a rather big difference between the middle-aged respondents and the oldest group of the respondents. The coefficient of the logistic regression model is about three, but the significance level of the coefficient is slightly over 0.05. Furthermore, the model reveals that among the high school graduates, there are over three and a half times more hikers and trekkers compared with the primary school or less educated persons. Among the village people, one may find over two times more hikers and trekkers than among the countryside dwellers. The respondents who are working in agriculture or forestry are evidently not very interested in hiking and trekking. The same can be said about those who have grown up in Lapland. Observing wild animals or plants as well as picking berries or mushrooms are important activities to the hikers and trekkers. A hiker and a trekker seeks first of all peace and silence as well as scenic experiences, or other impressive experiences, such as encountering wild animals or the experience of overnight, during his or her wilderness visit.

Nagelkerke's R-squared values as well as the values of c-statistics are rather low, especially for the logistic regression models for the wilderness motives. On the other hand, the models fit rather well. The model for the activities of hunting or fishing as well as the model for picking berries or mushrooms are the best with the remarkable high classification efficiencies and R-squared values.

6.3 The assessment of Finnish wilderness areas

6.3.1 The importance of wilderness preservation and the reasons for preservation

About 96 % of the respondents of Data Set 1 who answered the question (n=837), consider that wilderness preservation and protection is important. Slightly fewer than 4 % of the respondents (34 persons) do not see any reasons to preserve wilderness areas. Two persons answered that, on one hand, wilderness preservation is important and, on the other hand, it is not. The results of Data Set 2 are rather similar to those of Data Set 1, although the question was not exactly the same. The respondents of Data Set 2 were asked to evaluate the importance of wilderness conservation (*suojelu* in Finnish) instead of the wilderness preservation (*säilyttäminen* in Finnish). Furthermore, the alternatives to choose in Questionnaire 2 were: very important, rather important and not important at all. About 80 % of the respondents of Data Set 2 who answered the question (319 persons), consider wilderness conservation as very important, slightly under 17 % rather important and 2.5 % not important at all.

The reasons that have been mentioned for the wilderness preservation and conservation are quite similar, and they are in rather similar order in both data sets. The three most important reasons for wilderness preservation and conservation in the results of both data sets are the following: 1) the conservation of species, 2) wilderness preservation for future generations and 3) wilderness recreation. Even the order of these reasons is the same in the both data sets. The respondents of Data Set 2 have, however, emphasized a wilderness area's role in preserving nature's own character, naturalness. The other rather often mentioned reasons for preservation and conservation are: to ensure the function of the biosphere and ecological cycles, preservation of nature's beauty as well as the need to keep nature clean and unpolluted. Furthermore, wilderness areas are considered as important for the preservation of Finland's natural forests. Although the cultural importance of the wilderness areas is expressed directly, the idea is also reflected in the expression of originality and authenticity that wilderness areas include. The importance of wilderness areas to nature hobbies and nature education has been emphasized as well. The concern about the rarity of wilderness areas can be clearly noticed as well. The general anthropocentric meaning of the areas is expressed by saying that human beings need original nature (Fig. 48, Appendix 6).

Wilderness areas have been mentioned to be important to ecological research. Wilderness areas are certain reference areas to the managed areas. Some respondents refer to wilderness areas as ecological museums. Furthermore, some respondents mentioned the intrinsic values of wilderness; to preserve wilderness areas is humankind's duty just for the nature itself. A couple of the respondents mentioned that wilderness areas are important to

the defense of the country or for the natural sources of livelihood. Some respondents have noticed that there are many countries without any wilderness areas. Thus, our duty is to preserve the areas for the people of those countries (Appendix 6).

The reasons for wilderness preservation and conservation that have been expressed by the groups of the respondents are rather similar between groups

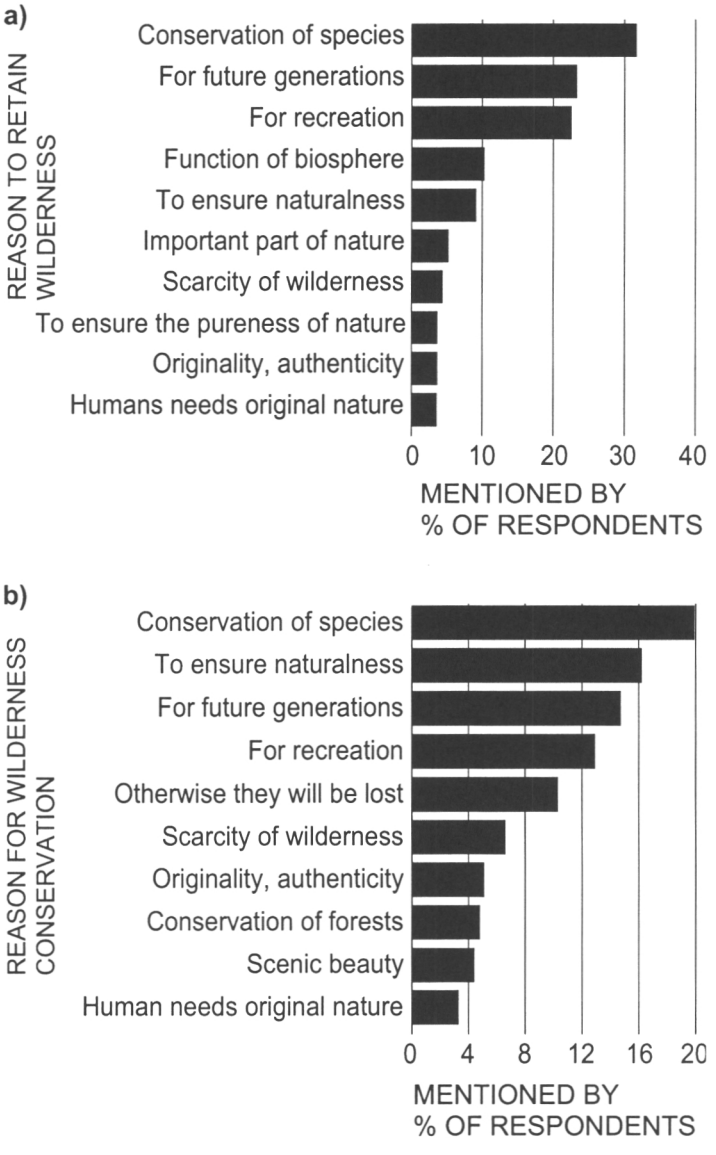


Fig. 48. Ten of the most often mentioned reasons for the preservation of the Finnish wilderness areas by the respondents of Data Set 1 (a) and Data Set 2 (b).

if the observations are based on the five most often mentioned reasons that each group of the respondents have mentioned. When the respondents have been grouped using fifteen different criteria, it is evident that statistically significant differences are found in the frequencies of the reasons that have been formed by the groups in four groupings in Data Set 1 and in three groupings in Data Set 2 (Figs. 49, 50). The differences are studied in the following using Pearson's chi-squared test and Kendall's coefficient of concordance or Spearman's rank order correlation coefficient telling the similarity in the order of the reasons.

The conservation of species is evidently the most often mentioned reason by those respondents who have not visited wilderness areas and by those who wish that we had more wilderness areas in our country. The older respondents of Data Set 2 perhaps consider the reason as a little more important and countryside dwellers as less important compared with the reference groups. Furthermore, there is some evidence that those persons who live in the southern part of the country, consider wilderness to be a more important environment for wild species than those who live in the other parts of the country (Figs. 49, 50).

It is difficult to say if there are any differences in the role of wilderness as a recreation environment between the city, village or countryside dwellers, although Figures 49 and 50 suggest some small contradictory differences. It is understandable that those respondents who have visited wilderness, mention more often the importance of wilderness recreation compared with the persons who have not visited. The difference is, however, rather small. Furthermore, wilderness recreation may be a little more important to the respondents who live in the eastern or northern part of the country. The greatest difference in appreciation of wilderness as a recreation environment has been found between the age groups of the respondents of Data Set 2. The sixty years old or older respondents mentioned the importance of recreation rather infrequently compared with the reference groups, especially compared with the forty years old or younger respondents. This difference has not, however, been found among the respondents of Data Set 1 (Fig. 49, 50).

Those who have visited wilderness have mentioned more often than the members of the reference group, the importance of wilderness areas for future generations. This difference can be noticed in the results of both data sets. Like in wilderness recreation, the differences between city, village and countryside dwellers of the two data sets are not similar in their opinions about the importance of wilderness for future generations. There is, however, one group that emphasize the importance of wilderness areas for future generations more clearly than the members belonging to the reference groups, the older respondents of Data Set 2 (Figs. 49, 50).

The emphasis of naturalness is apparently more typical for the urban and southern dwellers than those who are living in the countryside, especially in the northern part of the country. Among those who think that the extent of

wilderness areas is enough, there are more persons compared with the reference group who emphasize the importance of naturalness. On the other hand, among those who are not satisfied with the extent of the areas, there are more persons who emphasize the function of biosphere besides the conservation of species. These two latter mentioned reasons are important to the urban dwellers as well (Figs. 49, 50).

An interesting feature is that the countryside dwellers of Data Set 2 appreciate wilderness areas for the conservation of forests much more clearly than the members of the reference groups. Furthermore, the conservation of forests is evidently a little more important to the respondents who have not visited wilderness (Fig. 50).

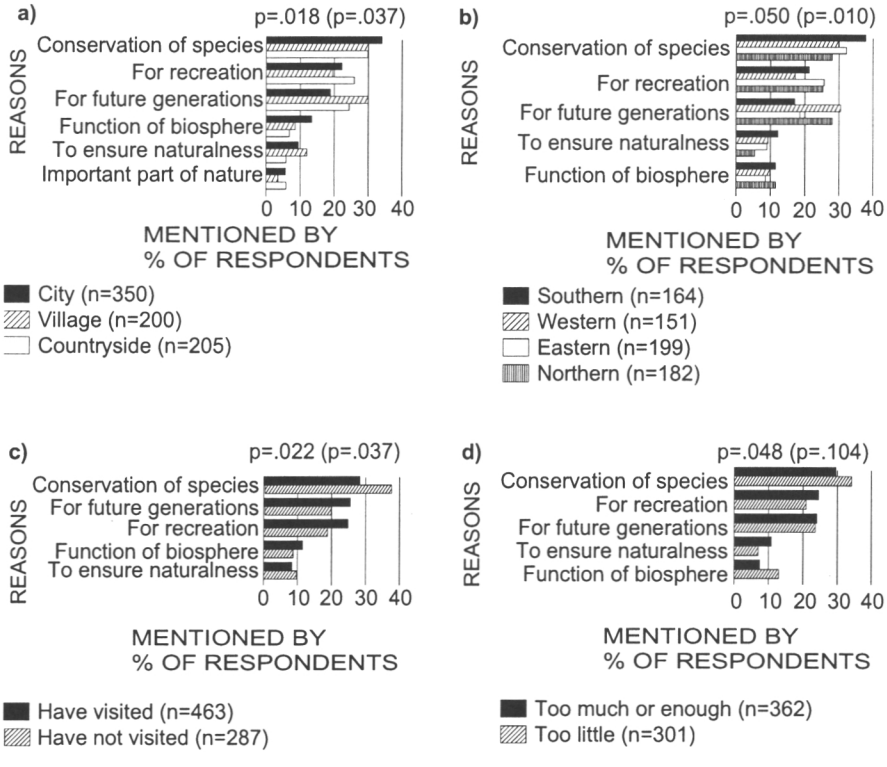


Fig. 49. The reasons for retaining the Finnish wilderness areas by the groups of the respondents of Data Set 1. The groups have been formed by the environment of residence (a), the geographical region of residence during childhood (b), the wilderness experience of the respondent (c), and the respondent's opinion about the coverage of the wilderness areas in Finland (d). The p-value of Pearson's chi-square test have been expressed without parentheses and the p-value of Kendall's coefficient of concordance (more that two groups) or Spearman's correlation coefficient (two groups) in the parentheses. Only the results with statistically significant differences using 5 % risk level have been published.

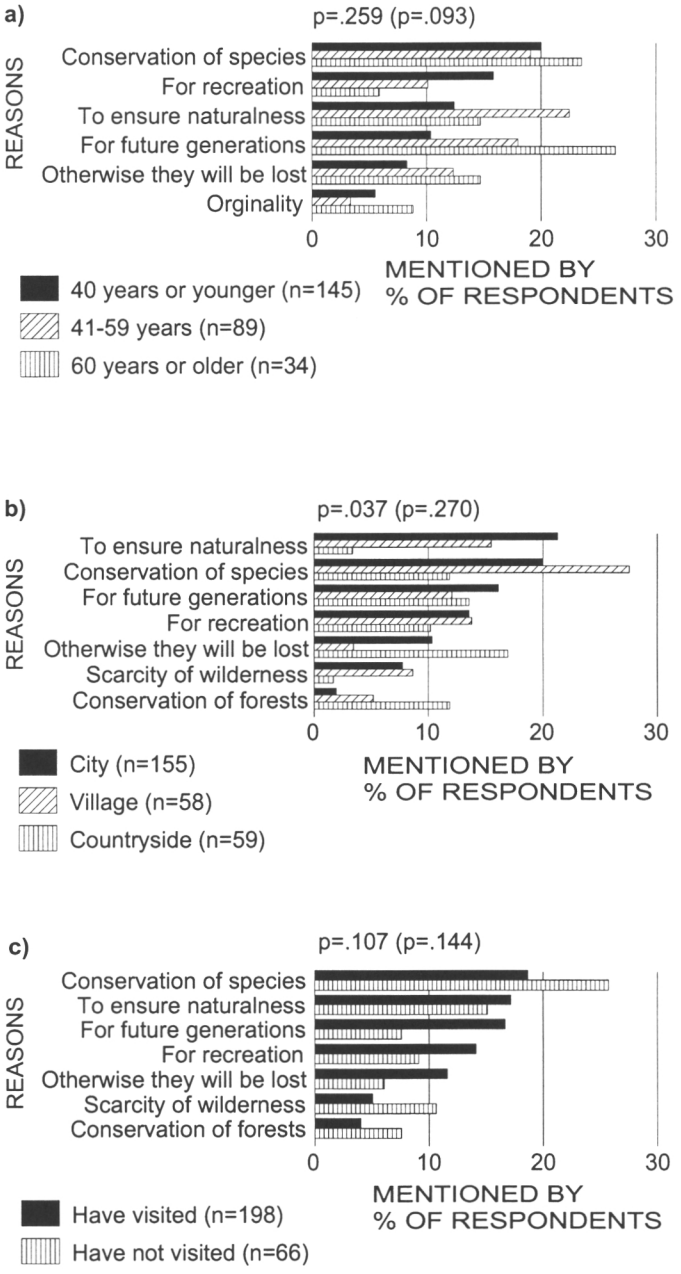


Fig. 50. The reasons for Finnish wilderness conservation by the groups of the respondents of Data Set 2. The groups have been formed by the age of the respondents (a), the environment of residence (b), and the wilderness experience of the respondent (c). The p-value of Pearson's chi-square test have been expressed without parentheses and the p-value of Kendall's coefficient of concordance (more than two groups) or Spearman's correlation coefficient (two groups) in the parentheses. Only the results with statistically significant differences using 5 % risk level have been published.

There may be differences in the frequencies of the reasons that have been mentioned by the groups of the respondents of Data Set 1, but the order of the reasons by the decreasing frequencies is rather similar from one group to another (Fig. 49). Figure 50, however, reveals that the order of the frequencies is rather different between those who have visited wilderness and those who have not, and especially between the city, village and countryside dwellers of Data Set 2. The main reason for wilderness conservation that was mentioned by the countryside dwellers, is simply that without conservation the wilderness areas will be lost! Furthermore, only some of the countryside dwellers of Data Set 2 have considered the scarcity of wilderness areas as a reason for the conservation of the areas. This reason has been mentioned much more often by the urban respondents.

Most of the respondents whose argument is that wilderness preservation or conservation is not important, gave reasons for their arguments. The three most often mentioned reasons are the following: 1) pollutants destroy wilderness areas, 2) old wilderness forests have to be regenerated and 3) wilderness preservation is not cost-effective. Some respondents consider that preservation is not important because there are not any wilderness areas left to preserve. On the other hand, a couple of the respondents argued that wilderness areas are not threatened. One respondent wrote that the whole of Finland is wilderness, and another argues that the wilderness concept is so vague that there are some difficulties in pointing out what are the areas to preserve. Other single, but interesting arguments against wilderness preservation, are the following: a man cannot hunt in nature conservation areas, local inhabitants suffer when the areas are protected, people get lost in the wilderness, wilderness conservation gives rise to the fights and people become hermits in the wilderness.

Finally, 80 % of the persons who have been interviewed by telephone thought that wilderness preservation is important, slightly over 3 % thought that it is not, 10 % could not say and about 7 % did not want to say his or her opinion. Those who regarded preservation as important, expressed the following reasons:

- the preservation of the species as well as for nature itself — 45.5 % of the persons
- preservation for nature and for the needs of human beings — 18.2 % of the persons
- preservation for recreation as well as the other human needs — 18.2 % of the persons
- preservation for future generations — 4.5 % of the persons
- the natural state of the areas is a value in itself — 4.5 % of the persons
- preservation of non-constructed areas — 4.5 % of the persons
- preservation for wilderness culture — 4.5 % of the persons

6.3.2 The extent of wilderness areas in Finland

The respondents of Data Set 1 were asked for their opinion about the extent of wilderness areas in Finland as well as the extent of protected wilderness areas in the southern and northern parts of the country. As a result, only a minority of the respondents considered that there are too many wilderness areas or too large areas left in our country. About 7 %, however, think that the coverage of protected areas in northern Finland is too much. On the other hand, nearly one-third of the respondents hope for more protected wilderness areas in the northern part of the country. Furthermore, about half of the respondents hope for more protected wilderness areas in the southern part of the country. About the same proportion of the respondents consider that there are still enough wilderness areas left in Finland, but slightly over one-third consider that there is not. Only a little more than one out of ten of the respondents have no opinion about the extent of the areas, but about one-fifth cannot say anything about the extent of the protected wilderness areas (Fig. 51).

There are differences between the groups of the respondents in their opinions about the extent of wilderness areas in Finland. The differences in the opinions about the protected wilderness areas in the northern part of the country will be studied more closely in the following, because most of the areas are situated in northern Finland and the debate about wilderness conservation has been strongest there. Statistically significant differences using Pearson's chi-square test between the groups have been found in nine groupings of the respondents. Only the differences between the groups with different environments of residence during childhood and between the groups

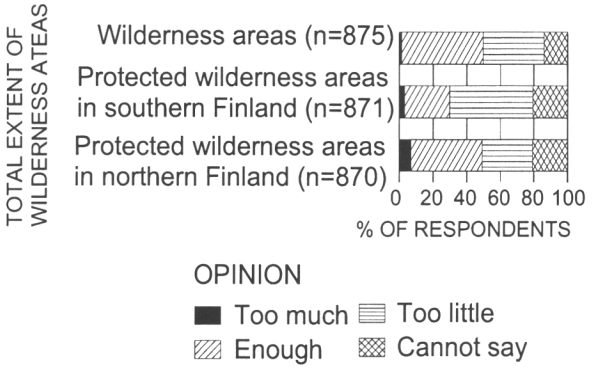


Fig. 51. The opinion of the respondents of Data Set 1 about the total extent of wilderness areas in Finland as well as about conserved wilderness areas in northern (Oulu and Lapland) administrative districts and southern (other districts) Finland.

with different occupations are not statistically significant. Eight of the differences have been introduced in Figure 52. Differences between the groups of the respondents who grew up in different geographical regions, have been excluded because the differences are very similar to the differences between the groups who are nowadays living in the regions.

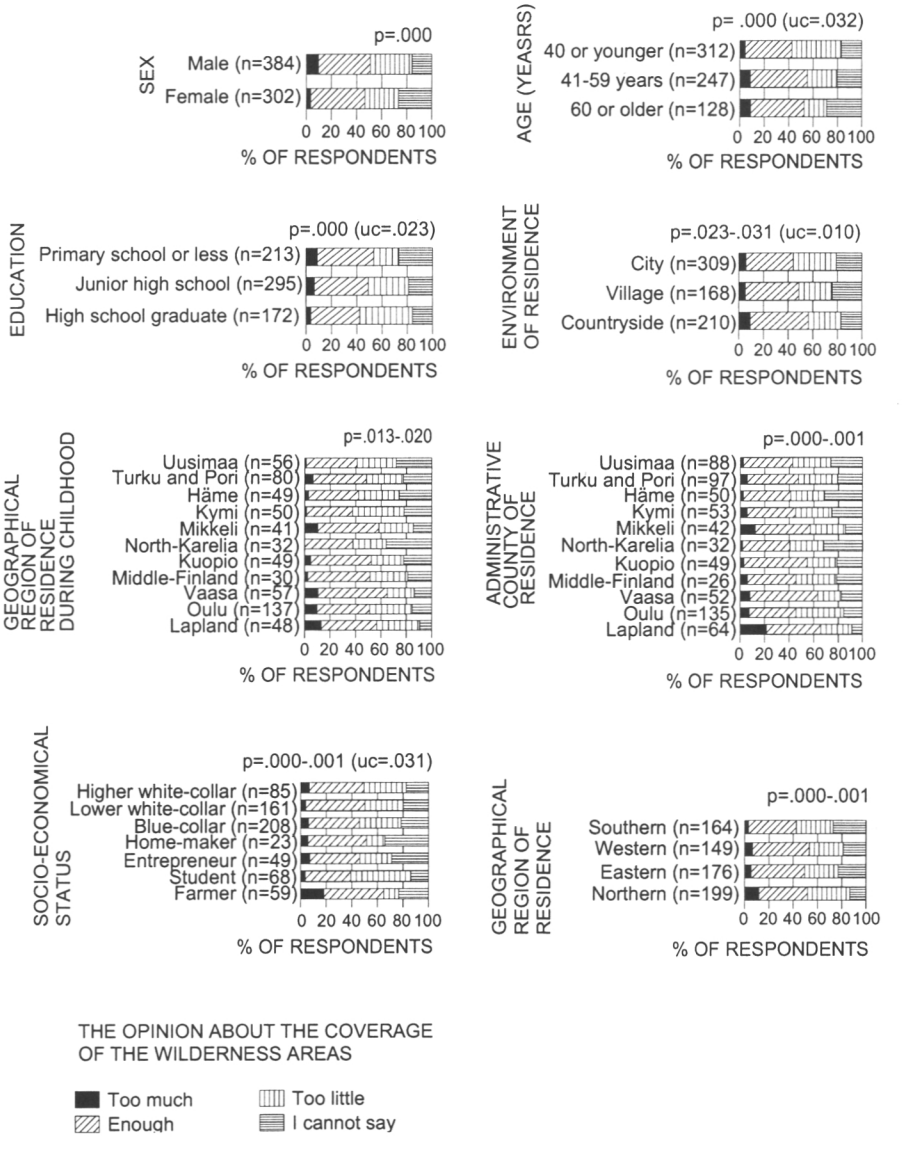


Fig. 52. Opinions about the total extent of wilderness areas in northern Finland (administrative districts of Oulu and Lapland) by the groups of the respondents of Data Set 1. P-value denotes the Monte-Carlo -estimated p-value of Pearson's chi-square test and uc the uncertainty coefficient. Only the significant results using 5 % risk level have been presented.

The opinions of the males are more distinct than the opinions of the females; a bigger proportion of the males is for and against conservation compared with the females. Females are more uncertain about it than the males. The resistance towards wilderness conservation increases with the growing age and the decreasing education of the respondents. Furthermore, there are more people among the urban dwellers who are for protection compared with the rural ones. There are remarkably more persons who are willing to overrule some of the decisions about wilderness conservation in northern Finland among the respondents of northern Finland compared with the respondents living in the other parts of the country. Furthermore, the difference between the administrative districts of Oulu and Lapland is very clear; the inhabitants of the administrative district of Oulu are much more for the conservation of wilderness than the inhabitants of Lapland. On the other hand, about the same proportion of the dwellers of Lapland are hoping for more wilderness preservation compared with the proportions of the other administrative districts. Thus, the distribution of the attitudes toward wilderness conservation is more abrupt in Lapland compared with the other parts of the country. The attitude distribution of the administrative district of Mikkeli is rather similar to that of Lapland.

The logistic regression models have been constructed to find the best background variables of the respondents to explain their hope for more wilderness areas in Finland as well as for more protected wilderness areas in the southern and northern parts of the country. The age and the socioeconomic status or occupation proved to be the best variables in the model building. The efficiency of the models in the explanation and classification of the respondents proved to be rather low, but the fit of the models with the data is rather good. In the following the odds ratios will be studied more closely (Table 38).

Among the youngest group of the respondents, the persons who are at most forty years old, there are nearly three times more respondents who hope for more wilderness areas in Finland, and about two times more who hope for more protected wilderness areas in northern Finland compared with the oldest group, this means the respondents who are at least sixty years old. Moreover, among the youngest group, there are nearly two times more of those who wish for more wilderness areas and protected wilderness areas in northern Finland compared with the middle-aged (41-59 years old) persons. Furthermore, compared with the farmers, there are from four to six times more persons in the socioeconomic groups of the white-collar employees, blue-collar employees or students who hope for more wilderness areas in Finland as well as from three and half to four times more of those in these socioeconomic groups who hope for more protected areas in northern Finland (Table 38).

Respondent's age and occupation proved to be the most significant variables in the model for protected areas in southern Finland. Thus the model

has been built using age and occupation instead of age and socioeconomic status. Similarly to the models for wildernes areas in Finland and protected wilderness areas in northern Finland, among the younger persons there are clearly more of those who support the conservation. The coefficients between each age group varies from one and half to two. Furthermore, compared the occupation group of agriculture and forestry with the other occupation groups, the probability to find a person who support for more protected wilderness areas in southern Finland is from two and half to seven

Table 38. The analysis table of the dichotomous logistic regression models between opinion about the coverage of wilderness areas in Finland of the respondents of Data Set 1 and the variables describing the background of the respondents. Only the statistically signigicant terms and parameter estimates have been presented using 5 % risk level.

Model design	Term in the model	Wald p	Group(s)	Reference group(s)	Exp (B)	R2	c-sta	H&L p
Wild=Age+ Socstat+Co	Age	.000	40 or younger	60 or older	2.89	.124	.663	.734
			41–59 years	60 or older	1.69			
			41–59 years	40 or younger	0.59			
	Socstat	.000	Upper white-collar	Farmer	5.61			
			Lower white-collar	Farmer	3.84			
			Blue-collar	Farmer	5.00			
			Entrepreneur	Farmer	2.50			
			Student	Farmer	5.77			
Protsouth=Age+ Occupati+Co	Age	.000	40 or younger	60 or older	3.73			
			41–59 years	60 or older	2.05	.177	.710	.973
			41–59 years	40 or younger	0.55			
	Occupati	.000	Scientific, technical	Agr., forestry	7.23			
			Social, health care	Agr., forestry	5.90			
			Administrative, office	Agr., forestry	5.98			
			Commercial	Agr., forestry	5.18			
			Service	Agr., forestry	4.78			
			Traffic, transportation	Agr., forestry	2.64			
			Industry	Agr., forestry	4.06			
			Traffic, transportation	Scientific, technical	0.37			
Protnorth=Age+ Socstat +Co	Age	.000	40 or younger	60 or older	2.27	.087	.641	.927
			41–59 years	40 or younger	0.51			
	Socstat	.047	Upper white-collar	Farmer	3.43			
			Lower white-collar	Farmer	2.90			
			Blue-collar	Farmer	3.53			
			Entrepreneu	Farmer	2.66			
			Student	Farmer	4.10			

The symbols of the dependent variables are: Wild=Coverage of wilderness areas in Finland, Protsouth=Coverage of protected wilderness areas in the southern part of the country, Protnorth=Coverage of protected wilderness areas in the northern part of the country. The classification of the binary response is: 1=Too low coverage, 0=Not too low coverage (reference category). The symbols of the independent variables are: Age=Age (classified). Socstat=Socio-economical status, Occupati=Occupation, Co=Constant. The abbreviations in the columns are the following: Agr., forestry=Agriculture, forestry, P-value of Wald's test (Wald p), Odds ratio (Exp(B)), Nagelkerke's R-squared, c-statistics (c-sta) and the p-value of Hosmer & Lemeshow's goodness of fit test.

times bigger in the other occupation groups. The only significant difference between the other occupation groups than agriculture and forestry is found between the groups of traffic, transportation and scientific, technical. Among the persons in the group of scientific and technical there are about two times more those who wish for more conservation compared with the persons who are working in traffic and transportation.

6.3.3 The favorite wilderness areas of the respondents

The respondents were asked for their favorite wilderness areas in Questionnaire 1. About one-third of the 804 respondents who answered the question could express their favorite wilderness. In most of the cases the wilderness area is situated in the administrative district of Lapland. Thus, the areas are situated in the districts of Lapland and Perä-Pohjola. Although the number of the expressions of the areas are divided by the area of the administrative districts, Lapland maintains its position. If the surface areas of the administrative districts are not taken into account, the administrative district of Oulu takes second place. The study of the expressions by districts reveals, however, that the most appreciated areas that are situated in the administrative district of Oulu are situated in the districts of Kainuu and Koillismaa, not so much in the district of Pohjanmaa. Furthermore, the district of Karelia, especially the northern part of the area, has some precious wilderness areas (Fig. 53).

When the favorite wildernesses are studied area by area, Urho Kekkonen National Park has been mentioned most often. About one-sixth of the respondents who have mentioned the name of an area mention Urho Kekkonen National Park. The municipality of Kuusamo takes second place with the half of the number of the expressions compared with the number for Urho Kekkonen National Park. Other highly appreciated areas in Finland are the northern parts of the municipality of Enontekiö (the area of Käsivarsi), Hossa in the Municipality of Suomussalmi, the area of Kessi-Vätsäri and Lemmenjoki National Park in the Municipality of Inari, Oulanka National Park in the Municipalities of Salla and Kuusamo, Pyhätunturi National Park in the municipality of Pelkosenniemi as well as Kolovesi National Park belonging to the lake system of Saimaa in the municipalities of Enonkoski, Heinävesi and Savonranta. All these areas have been mentioned at least by four of the respondents. Besides these areas, sixty-five other areas have been mentioned at least once.

Many of the respondents did not mention the area by name. Instead, they mention their favorite wilderness ecosystem or some other expressions describing the area. The expression of forest has been mentioned by twelve respondents, mire by ten and lake or pond by eight respondents. Nine persons have mentioned that their favorite wilderness is a virgin forest or other untouched forests, and seven of the respondents mentioned that their most

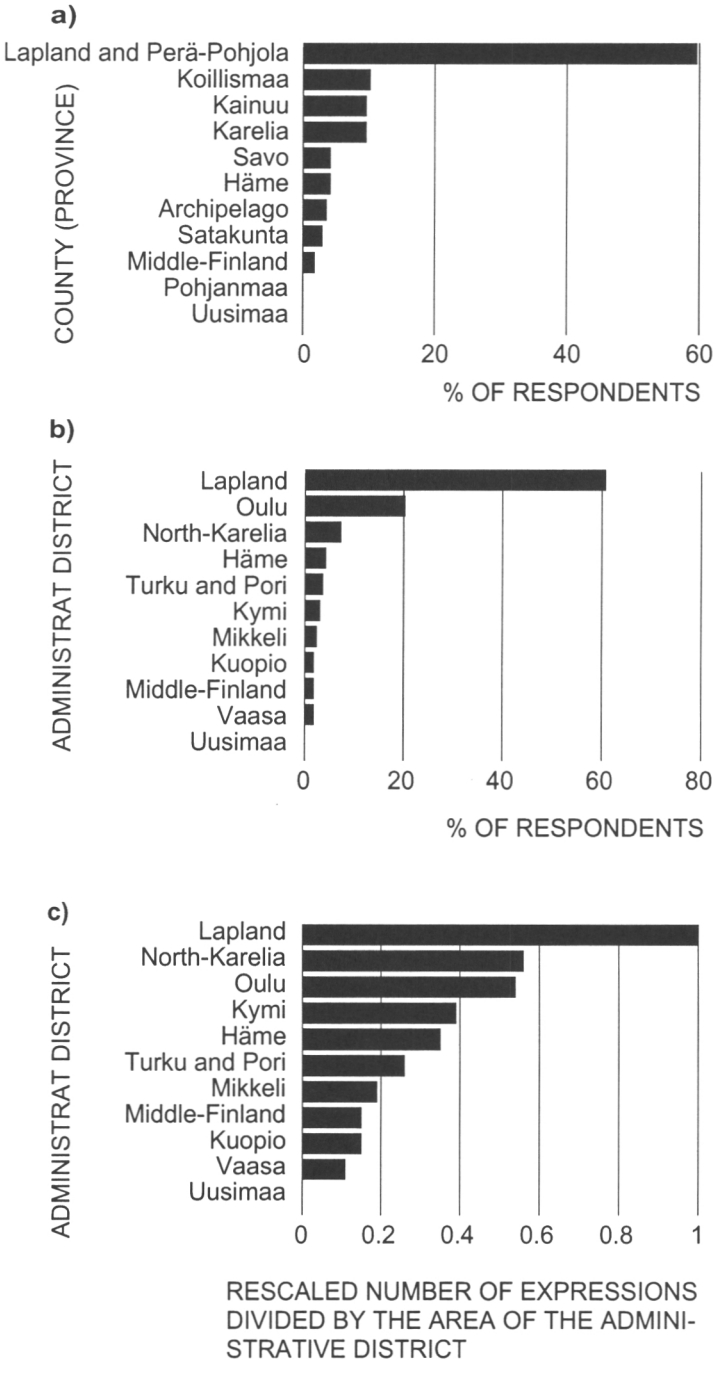


Fig. 53. The location of the favourite wilderness areas of the respondents of Data Set 1 in different counties (a) and administrative districts (b) as well as the ratio counted by dividing the number of the expressions for an administrative district by the area of the county (in 1000 square kilometers) and scaling the ratio of Lapland as one (c). The counties of the favourite wilderness areas have been expressed by 166 respondents and the administrative districts by 163 respondents.

highly appreciated wilderness area is an area in its complete natural condition regardless of the ecosystem. The fells as well as the untouched spruce-hardwood growing mires have been mentioned by four of the respondents and a rocky area by three of them. Besides these, forty-five other expressions have been mentioned.

At least half of the respondents who live in the other administrative districts than Kuopio or Middle-Finland and who could express their favorite wilderness area, mention that it is located in the administrative district of Lapland. It is remarkable that all the dwellers of Lapland have found their favorite wilderness in Lapland. Furthermore, the eastern respondents like the wilderness areas of Lapland as well as the areas that are situated in the eastern part of the country (Table 39).

Table 39. The location of the favourite wilderness areas of the respondents of Data Set 1 by the administrative districts of residence of the respondents.

Administrative district of residence	The location of the favourite wilderness of a respondent in the administrative district											n
	Uusimaa	Turku and Pori	Häme	Kymi	Mikkeli	North-Karelia	Kuopio	Middle-Finland	Vaasa	Oulu	Lapland	
Uusimaa			1	1		1	1	1		5	12	20
Turku and Pori		4	3			2			1	2	14	24
Häme			1			2			1		6	10
Kymi				2	1	1				1	5	9
Mikkeli					2	1				2	5	10
North-Karelia						3					7	9
Kuopio					1	1	2			1	4	9
Middle-Finland		1	1					1		1	2	5
Vaasa		1	1	1					2		5	9
Oulu				1		1		1		19	22	41
Lapland											17	17
Total		6	7	5	4	12	3	3	3	31	99	163

6.3.4 The contingent valuation of wilderness areas

The respondents of Data Set 1 were asked, using an open-ended question, how much money they would give for the conservation of wilderness. Furthermore, they could name the area or areas for which they would be willing to give money if there was a certain area they wanted to promote. As a result, about 55 % of those who answered the question express their willingness to give at least some money for conservation. A part of the respondents would give money but they would want to determine some conditions for their donation. Furthermore, there are rather many who would give money, but could not tell how much. About a third of those who would give some money for conservation could name the area, at least in which part of the country the area is situated, for which the money would be donated. Although the respondents were not asked to give the reasons why they would not be willing to give money for the purpose, some of them told the reason. Slightly under 4 % of those who answered the contingent valuation question would not be willing to give money because they think that it is state's duty to conserve the areas and the money for the purpose should be collected by taxes.

More than half of the respondents (about 65 %) would give money for the conservation of the areas of Northern Finland and about one-fourth for the areas of eastern Finland. Slightly under 15 % of the respondents would give money for the areas that are situated in the southern part of the country and the same proportion mention that their objects are situated in the southern or western regions of the country.

If the values of the administrative districts are estimated using the sums of the money that the respondents mentioned, Lapland takes first place. If the sum of the money for an administrative district is, however, divided by the area of a district, the administrative district of Kymi would receive the biggest sum. Lapland takes fourth place with a sum of money about one-third of Kymi's sum. It is notable that some single respondents have mentioned rather big sums of money for the wilderness areas of Lapland, Kymi and Mikkeli. Because there are just a few respondents who are willing to support the conservation of the areas of Kymi and Mikkeli with their money, the mean of the sum for the districts remains high. Furthermore, if the means are divided by the areas of the districts, the administrative districts of Oulu and Lapland drop down, and the winners are the districts of Kymi, Mikkeli and Uusimaa (Fig. 54). Thus, the latter mentioned way to calculate the "values" of the wilderness areas in the different administrative districts, suggests how much money a respondent is willing to give in order to support the conservation of the wilderness areas in an administrative district in proportion to each of the thousand square kilometers of the districts. One has to remember, however, that a respondent may have his or her favorite area, the only one that he or she wants to support with a donation.

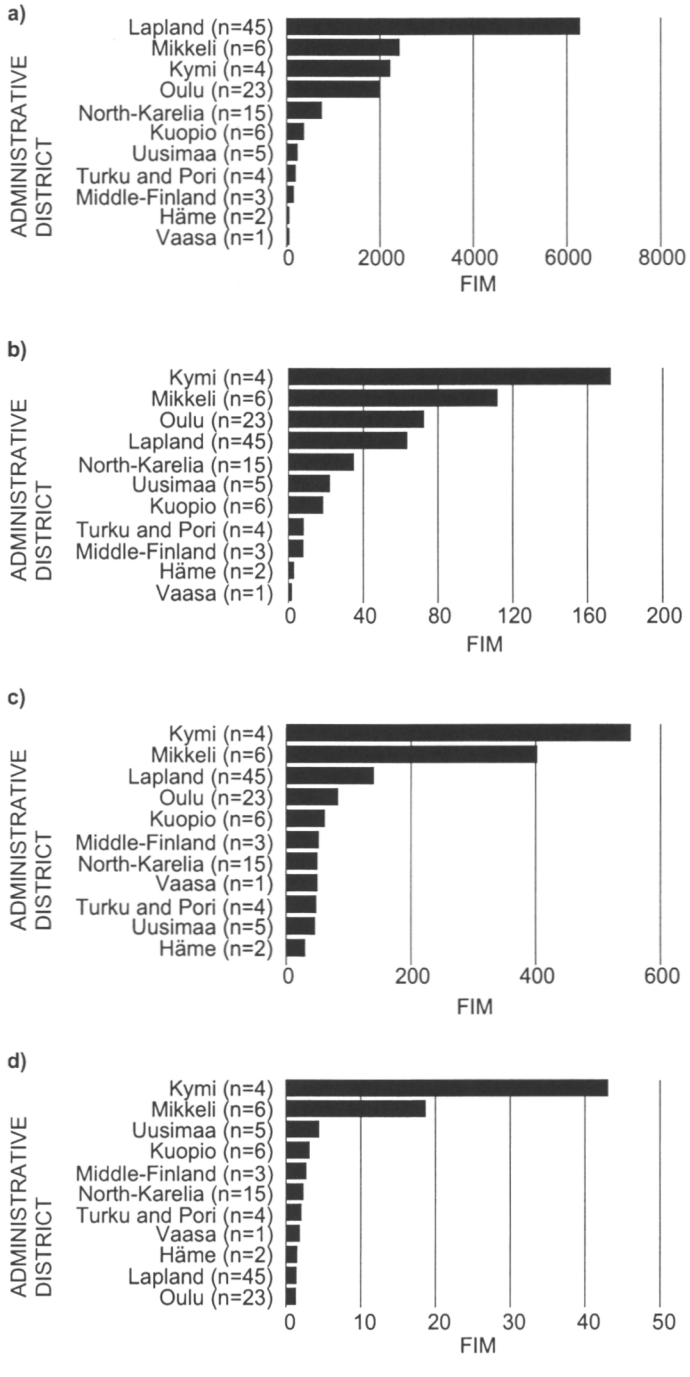


Fig. 54. The sums (a), the means (the sum divided by the number of respondents) (b), the sums divided by the areas of the administrative districts (c) and the means divided by the area of the administrative districts (d) of the money in Finnish marks for the wilderness conservation of the administrative districts expressed by the respondents of Data Set 1 as an answer to the contingent valuation question. N denotes the number of respondents who expressed their willingness to contribute money for conservation.

A logistic regression model was used to find out the best predictors among the variables describing the background of the respondents in order to predict what are the persons like who are willing to give their money for the wilderness conservation. The model reveals that the strongest predictors are age, administrative district of residence and the socioeconomic status of a respondent. The persons who are at most forty years old, express their will to give money for the purpose nearly two times more often than the middle-aged respondents and over two times more often than those sixty years old or older. Observing the socioeconomic status, it is evident that among the persons belonging to all the other groups besides the farmers, there are a little over two to over six times more persons who are willing to give their money for wilderness conservation compared with the farmers. The entrepreneurs are not as willing as the higher white-collar workers or students to give their money for wilderness conservation. Furthermore, among the dwellers of the administrative districts of Uusimaa, Turku and Pori, Kuopio and Oulu, there are from two to a little over three times more of those who express their willingness to give at least some money for the purpose compared with the dwellers of Lapland. Among the respondents of Häme and Kymi there are somewhat less the donors than in the administrative districts of Uusimaa as well as Turku and Pori (Table 40).

An extra examination was done to find out if there are any differences among the respondents belonging to the different motive and activity groups in their willingness to give or not to give money for wilderness conservation keeping in mind the differences in the background of the respondents belonging to certain groups. As a result, Pearson's chi-square test reveals significant differences between the motive ($p=0.000$) as well as between the activity ($p=0.006$-0.011) groups. The biggest proportion of those persons who are willing to give at least some money are in the motive groups of those who test themselves in wilderness areas (75 % willing), among those who seek beautiful scenery (67 % willing) as well as those who seek peace and silence (69 % willing). In the other groups, the proportion of the willing persons is slightly under 50 %. The corresponding examination of the activity groups reveals that among photographers or picture painters as well as among those who visit wilderness in order to observe wild organisms, slightly over 70 % are willing to give the money for the purpose. Among the hikers and trekkers the proportion is about 60 %, among the hunters or fishermen slightly under 60 % and among the berry or mushroom pickers 50 %.

Although there are remarkable differences among the respondents in their willingness to give or not to give money for wilderness conservation, the amount of money that a respondent promises to give for the purpose does not differ very much between the members belonging to the different groups. Only the differences in the sums of the money between city, village and countryside dwellers are statistically significant testing the differences using Kruskal-Wallis' one way analysis of variance with the risk level of less

than 5 %. The mean and the median values (the latter mentioned in parentheses) are the following: the city dwellers 76 Fmk (20 Fmk), the village dwellers 56 Fmk (50 Fmk) and the countryside dwellers 73 Fmk (50 Fmk). The variation among the city dwellers is the biggest.

Table 40. The analysis table of the logistic regression model between the three variables describing a person's attitude towards Finnish wilderness areas and the variables describing the background of the respondents of Data Set 1. Only the statistically significant terms and parameter estimates have been presented using 5 % risk level.

Model design	Term in the model	Wald p	Group(s)	Reference group(s)	Exp (B)	R2	c-sta	H&L p
Gm=Age+Admres+ Socstat +Co	Age	.000	41–59 years	40 or younger	0.59	.146	.692	.939
			60 or older	40 or younger	0.41			
	Admres	.015	Uusimaa	Lapland	2.50			
			Turku and Pori	Lapland	3.23			
			Kuopio	Lapland	2.40			
			Oulu	Lapland	2.06			
			Häme	Uusimaa	0.48			
			Kymi	Uusimaa	0.46			
	Socstat	.000	Upper white-collar	Farmer	4.62			
			Lower white-collar	Farmer	3.49			
			Blue-collar	Farmer	3.59			
			Home-maker	Farmer	3.38			
			Entrepreneur	Farmer	2.34			
			Student	Farmer	6.38			
			Entrepreneur	Upper white-collar	0.51			
Pn=Age+Admres+ Occup+Co	Age	.000	40 or younger	60 or older	3.69	.198	.730	.992
			41–59 years	60 or older	1.70			
			41–59 years	40 or younger	0.46			
	Admres	.002	Uusimaa	Lapland	2.64			
			Turku and Pori	Lapland	3.42			
			Middle-Finland	Lapland	4.29			
			Oulu	Lapland	2.13			
			Kymi	Uusimaa	0.46			
			Vaasa	Uusimaa	0.26			
	Occup		Technical, scientific	Agriculture, forestry	3.77			
			Social, health care	Agriculture, forestry	3.82			
			Commercial	Agriculture, forestry	3.73			
			Service	Agriculture, forestry	2.18			
			Industry	Agriculture, forestry	3.15			
Tw=Sex+Age+ Regres+Co	Sex	.000	Male	Female	2.02	.153	.696	.952
	Age	.000	40 or younger	60 or older	3.51			
			41–59 years	60 or older	2.56			
			41–59 years	40 or younger	0.73			
	Regres	.000	Southern	Northern	0.43			
			Western	Northern	0.34			
			Eastern	Northern	0.47			

The symbols of the independent variables are the following: Age=Age (classified), Regres=Geographical region of residence, Admres=Administrative county of residence, Socstat=Socio-economical status, Occup=Occupation Co=Constant. The symbols of the dependent variables are the following: Gm=Respondent's will to give money for wilderness conservation (Yes/No), Pn=Respondent's will write his or her name on the petition in order to support wilderness conservation (yes/no), Tw=Does the respondent travel annually in order to visit wilderness (yes/no). The abbreviations in the columns are the following: P-value of Wald's test (Wald p), Odds ratio (Exp(B)), Nagelkerke's R-squared, c-statistics (c-sta) and the p-value of Hosmer & Lemeshow's goodness of fit test.

The willingness of the respondents to support wilderness conservation economically is in most cases directed towards certain areas. The most often mentioned areas are Koli (in the administrative district of North-Karelia), Kessi (Lapland), Urho Kekkonen National Park (Lapland), Talaskangas (Kuopio), Sopenmäki (Oulu), Saimaa Lake system (in eastern Finland),

Table 41. Some results of the contingent valuation question expressed in Finnish marks. The areas and the money for the areas have been chosen by the respondents of Data Set 1, and expressed by the sum and the mean of the value. N denotes the number of the respondents who expressed their will to give money for the area.

Area	Municipality/municipalities	Sum	Mean	n
Saimaa	–	2210	553	4
Hammastunturi Statutory Wilderness Area	Inari	2000	2000	1
Kessi	Inari	1310	187	7
Urho Kekkonen National Park	Inari, Savukoski, Sodankylä	530	66	8
Elimyssalo	Kuhmo	500	500	1
Koli National Park	Kontiolahti, Lieksa	345	43	8
Isosuo	Kuhmo	300	300	1
Talaskangas	Vieremä	270	39	7
Käsivarsi Statutory Wilderness Area	Enontekiö	170	57	3
Sopenmäki	Vaala	160	53	3
Nuuksio	Espoo, Helsinki, Vihti	150	50	3
Martinselkonen	Suomussalmi	140	47	3
Valtavaara	Kuusamo	100	100	1
Hossa Recreational Area	Suomussalmi	100	100	1
The Archipelago of Turku	–	100	100	1
Hirsineva	Haapajärvi	100	100	1
Koitajoki	Ilomantsi	100	100	1
Inariskaidi	Inari	100	100	1
–	The rural municipality of Mikkeli	100	100	1
–	Saarijärvi	100	100	1
–	Liminka	100	100	1
Patvinsuo National Park	Ilomantsi, Lieksa	50	50	1
Seitseminen National Park	Kuru, Ikaalinen	50	50	1
Pyhätunturi National Park	Pelkosenniemi	50	50	1
Luosto Naturally Managed Forest	Sodankylä	50	50	1
Muotkatunturi Statutory Wilderness Area	Inari, Utsjoki	50	50	1
–	Sipoo	50	50	1
–	Varkaus	50	50	1
–	Perho	50	50	1
–	Ylitornio	50	50	1
Käskynvuori	Kihniö	20	20	1
The Archipelago of Rauma	–	20	20	1
Rörstrand	Sipoo	20	20	1
-	Kuusamo	20	20	1
Isosyöte Recreational Area	Pudasjärvi	10	10	1
Piltua	Pudasjärvi	10	10	1
–	Suomussalmi	10	10	1
–	Sotkamo	10	10	1
The wild reindeer areas of Suomenselkä	Kivijärvi, Kinnula, Perho	5	5	1
–	Ilomantsi	5	5	1

Nuuksio (Uusimaa), Martinselkonen (Oulu), Archipelago of Turku (Turku and Pori) and Käsivarsi Statutory Wilderness (Lapland). The lake area of Saimaa collects the biggest sum of the money, over two thousand Finnish marks with the mean value of 553 FIM. Only one of the respondents promises the money for the preservation of Hammastunturi Statutory Wilderness Area in Inari, Lapland, but the sum of the money is 2000 marks. The other areas with remarkably high average sums of the money are Elimyssalo Nature Conservation Area as well as the area of Isosuo in the Municipality of Kuhmo and the area called Kessi in the Municipality of Inari (Table 41).

6.3.5 The respondents' willingness to sign a petition for wilderness conservation

The respondents of Data Set 1 were asked if they were willing to support wilderness conservation by signing a petition demanding more wilderness conservation. In addition to those 50 % of the respondents who want both to give some money and put their name on the paper, 21 % express their willingness to sign their name without giving any money. About a fourth of the respondents would not be willing to either give money or sign the petition. Eight hundred and twelve persons answered the question. About 40 % of the respondents would support the wilderness areas of Lapland, 20 % the area of North-Karelia and 20 % the administrative district of Oulu. About 10 % of the respondents would support an area that is situated in the administrative district of Kuopio and slightly less than 6 % an area in the administrative districts of Uusimaa and Mikkeli. If the number of the expressions for each of the administrative districts is divided by the area of the district, North-Karelia takes first place (the ratio is 1.16), Uusimaa second (the ratio is 0.77) and Kuopio third place (the ratio is 0.65).

A logistic regression model was used to determine the strongest predictors in the background of the respondents to predict a person's willingness to sign a petition for wilderness conservation. The models in Table 40 reveal that almost the same variables are the most important for the contingent valuation and the signature. A person's socioeconomic status and occupation are very dependent on each other. Thus, it is understandable that both of the variables can successfully be used in the models. However, in the model for predicting a respondent's willingness to sign a petition, occupation proved to be slightly more dependable than socioeconomic status when the fitness was measured using likelihood ratio statistics.

In the age group of forty years old or younger, there are over three and half times more respondents who express their willingness to sign a petition compared with the sixty years old or older group, and two times more than there are among the middle-aged respondents. Among the latter mentioned group, there are slightly over one and half times more respondents willing to sign a petition than among the oldest group. The differences among the

respondents who are living in different administrative districts are rather similar to the differences that were noticed in the contingent valuation question. The respondents who live in the district of Middle-Finland are, however, much more willing to sign a petition than to give money for the cause. Furthermore, there are about four time more respondents willing to sign a petition among the dwellers of Uusimaa compared with those of Vaasa, and two times more compared with the dwellers of Kymi. Among the respondents who are working in the scientific, technical, social, health care, commercial, service or industrial occupations, there are from two to four times more who express their willingness to sign a petition compared with those who are working in agriculture or forestry.

6.3.6 Annual travelling of the respondents to visit wilderness

The respondents of Data Set 1 were asked how many kilometers they travel annually (during a typical year) to visit wilderness. The number of kilometers describes indirectly how much a person appreciates wilderness. Four

Table 42. The annual number of travelled kilometers during a typical year for the wilderness visits by the groups of the respondents of the Data Set 1. Only the groupings with statistically significant differences using 5 % risk level are presented. P-values denote the differences between the groups testing the data using Mann-Whitney's U-test (two groups) or Kruskal-Wallis' one-way analysis of variance (more than two groups). N denotes the number of the respondents in the group and I.Range the interquartile range.

Variable	Group	n	Mean	Median	Range	I.Range	p
Sex	Male	254	1294	500	60000	1150	.000
	Female	158	646	288	10000	775	
Age (years)	40 or younger	213	847	500	10000	900	.015
	41–59 years	151	1501	500	60000	1200	
	60 or older	46	513	155	3497	610	
Education	Primary school	105	734	300	10000	950	.048
	Junio high school	197	1343	500	60000	900	
	High school graduate	104	816	500	5000	900	
Environment of residence	City	175	982	500	10000	900	.004
	Village	122	916	500	7998	900	
	Countryside	114	1291	200	60000	950	
Environment of residence during childhood	City	106	1109	650	7995	1613	.001
	Village	67	1798	500	59995	900	
	Countryside	233	780	300	10000	900	
Primary activity during the wilderness visits	Observing wild organisms	73	1601	400	59998	900	.000
	Hunting or fishing	91	1361	500	10000	1050	
	Picking berries or mushrooms	103	581	125	10000	500	
	Photographing or painting	15	1173	800	6000	1300	
	Hiking and trekking	86	988	750	4990	925	

hundred and ten of the respondents expressed that they have traveled annually to visit wilderness and estimated the number of the kilometers as well. The following numbers describe the traveled distances: the sum 430 813 kilometers, the maximum 60 000 and the minimum 0 kilometers, the mean 1 051 and the median 438 kilometers

When the effect of the background of the respondent on his or her annual wilderness visits (whether he or she is visiting wilderness or not) is studied using the logistic regression model, it becomes evident that among the males, there are two times more of them who annually visit wilderness at least once. Furthermore, the proportion of wilderness visitors decreases with growing age; among the forty years old or younger group, there are about three and a half times more the visitors compared to those sixty years old or older. Finally, the dwellers of northern Finland are from two to three times keener to visit wilderness than the dwellers of other parts of the country (Table 40).

There are statistically significant differences between the groups of the respondents in the number of the kilometers that they travel annually to get to wilderness as well (Table 42). The males travel almost two times longer for their visits than the females. Middle-aged persons are perhaps the age group that travels the most, although the most reliable indicator, the median, indicates no differences between this age group and the youngest group (forty years or younger persons). The sixty years old or the older respondents travel the least to get to wilderness. The pattern between the education groups is rather similar to that of age groups, but reversed; the members of the lowest education groups travel the least. Furthermore, the urban dwellers travel clearly more than those who live in the countryside. There are also differences between the activity groups. Although there are certain persons among the animal or plant observers as well as among the hunters or fishermen who tell that they travel very long distances annually to visit wilderness, a typical nature photographer or painter as well as hiker and trekker travels the most. However, the numbers in Table 42 reveal that the respondents who collect wild berries or mushrooms travel the least.

7 Discussion

7.1 Discussion about the methods

7.1.1 The selection of the approaches

The main problem in studying sociological or psychological issues like wilderness use and wilderness experience is the selection between qualitative and quantitative methods. The qualitative method arises from the hermeneutic philosophy (Kusch 1986). The concept of qualitative method cannot, however, be determined accurately. The approach consists of many different methods. Tesch (1990) has even claimed that there are no qualitative methods, only qualitative data. Furthermore, the scientific validity of the methods has been under intense discussion, and the methods have been developing. The potential of the methods in leisure studies has, however, been admitted during the past fifteen years (Henderson 1991, Karjalainen 1996a).

The main goal in the qualitative approach is to understand and interpret the human phenomenon or experience itself (Silverman 1993, Karjalainen 1996a), not to explain the things and find causal "laws" using numerical data and statistical methods. The meanings that persons give to certain phenomenon or experience are important to qualitative understanding and interpretation. Using the qualitative methods, a researcher has to find out the intrinsic logic behind the phenomenon. The results of a qualitative analysis cannot be generalized like the results of a quantitative analysis. Thus, the goal of the results is not to study the generality of a phenomenon, or the attitudes of large groups (Karjalanen 1996a). Interviews, observations, personal experiences, introspection, discussions as well as the products of different cultures are examples of the qualitative methods in collecting data (Karjalainen 1996a). The qualitative methods are powerful especially in studying sensitive or shameful problems (Eskola 1975, Jyrinki 1976, Grönfors 1982, Alasuutari 1993). The sharp distinction between qualitative and quantitative approaches is, however, not necessary, and a researcher needs both methods in the development of theories as well as in understanding and interpreting a phenomenon or explaining the connections between things (see Karjalainen 1996a).

A structured questionnaire is a typical quantitative method, particularly when the answers are coded and treated as statistical units. The latter mentioned methods were chosen in this work, because the main goal is to develop some rough guidelines about the scenic properties of wilderness forests, the contents of wilderness experience as well as the recreational use of wilderness areas. Furthermore, a goal is to generalize the results, to a certain extent, to the main population.

Some researchers (e.g. Miettinen 1993, Paajanen 1994, Rihtniemi 1995, Karjalainen 1996a) have doubted that the quantitative approach can lead to

reliable or meaningful results, particularly in studying such fragile and many-sided problems as human landscapes, or some other nature experiences as well as the motives behind certain recreation activities. The results may even be misleading. These statements have not, however, been based on any empirical research. Merely they are a result of theoretical discussion. Lets look some of the statements. Rihtniemi (1995, p. 27) writes (translated into English):

> The preference studies about the properties of forests give some evidence about liked as well as disliked properties. The results do not, however, give any means for studying the aesthetic consequences of forestry activities.

This statement should be proven much more carefully, particularly the wording may be too abrupt. The author continues (p. 27, freely translated into English):

> Preference studies have concentrated on indicating common attributes of the public, and do not tell anything about the differences between the different groups of people...

This statement may be notable. Some of the differences between the groups of people are, however, rather easy to find out using quantitative methods. Miettinen (1993) criticizes the simplicity of the results of preference studies. He claims that these studies have not revealed any new knowledge about the landscape preferences that has not already been recognized in the literature of a hundred years ago. This may be true if we study only the properties that are considered to be beautiful. The other level is, however, to try to find out the strength of the effect of the properties on the aesthetic experience, and perhaps to build some mathematical models, such as Pukkala et al. (1988) have done. These models have not been used in computers a hundred years ago to predict the amenity values of the forests. Furthermore, Rihtniemi (1995, p. 28) claims:

> The aesthetic experience is not reflected in preference studies.

As part of the argument, she states that preference studies do not make any specifications about things that influence experience, and that the parts of the whole as well as "the spirit of the place", or individual meanings do not reflect in the results of the studies. The definition and interpretation of the aesthetic experience is, however, rather complicated as has been pointed out in Chapter Two in this work. The specification of the things that influence the aesthetic experience may not be the inevitable feature of the experience. A scream of a person may reflect a person's aesthetic experience, and the experience may be "true" in spite of the fact that the person cannot specify the content of his or her experience nor the features in the environment that have had an effect on the experience.

Three different approaches have been used in preference studies to find the connections between scenic experience and characteristics of an environment. Some researchers have asked the respondents to express their experience using certain scales. In some of the studies, the respondents have estimated many properties of the environment, such as scenic beauty and an environment's suitability for outdoor recreation and so on. The elements of the environment may have been analyzed to a certain extent, but the elements have not been used as independent variables in statistical analysis in order to explain the experience (e.g. Daniel & Boster 1976, Hultman 1983a, Saastamoinen 1982, Kellomäki & Savolainen 1984). Thus the elements that cause the experience remain rather unknown. The other approach is to ask the respondents to specify the elements in nature and their effect on their experience (e.g. Magill 1994). Besides quantitative analysis, data like this might be analyzed using qualitative methods. The third approach that has been used in this work as well as by Pukkala et al. (1988) is to ask the respondents to express their experience using a certain scale, to measure the elements in a scene and to use particular statistical methods to determine the interdependencies between the experience and the elements.

An aim of the quantitative approach that has been used in this work is to develop some standards for the preservation of wilderness. The standards have to involve three basic criteria: objectivity, measurability and evaluation. This means that the standards must be defined and articulated. They have to have some criteria for assessing success or failure. Furthermore, critical evaluation of objective data is required (Shindler 1992). Although this work is just the first step in developing the standards for the preservation of Finnish wilderness areas, it is better to take the step than to accept a complete lack of standards. The need of standards for forest planning has been noticed in the United States as well (Shindler 1992). Certain characteristics of wilderness standards may be applicable to non-wilderness settings as well. The standards have to be accepted by broad groups of people, including users of the areas as well as non-users (Brunson & Rodriquez 1992, Manning 1992).

However, much work should be done in studying how landscapes and aesthetic experiences affect the human mind. The same can be said about the study of outdoor recreation motives. The work should be done using both quantitative and qualitative approaches comparing the results with each other. One thing, however, is sure: a deeper understanding of the features that are involved in the motives as well as the landscape (aesthetic) experience needs qualitative research as well. On the other hand, the quantitative analysis may be a valuable "backbone" in the way to the understanding. Many researchers have done quantitative analysis in studying the motives of nature recreation users, building motivation scales or studying the feelings that belong to the recreation experience (e.g. Hammitt 1982, Driver 1983, Stankey & Schreyer 1987, Hammitt & Madden 1989, Saarinen 1996)

as well as the effect of the properties of landscapes on the scenic experience (e.g. Daniel & Schroeder 1979, Hultman 1983a, 1983b Kellomäki & Savolainen 1984, Pukkala et al. 1988, Merigliano 1990a, Vaske et al. 1992, Haider 1994).

The analysis of the *narrative literature* in this work is based on an analysis of the content. Berelson (1952, p. 18) defines content analysis as "the technique for the objective, systematic and quantitative description of the content of the communication". Furthermore, Eskola (1975, p.107) defines the concept more broadly as, "the scientific research of the content of the communication". The data in this study consists of words. Thus, the data may be considered as qualitative data (Henderson 1991, Uusitalo 1991). However, the data has been analyzed mainly using numbers (frequencies), resembling the quantitative analysis.

Besides the analysis of the data, one has to evaluate the collection of the data itself. If the main population for the content analysis is very large, some sampling methods should be used (Pietilä 1976). One interesting thing in the evaluation of the data is how much data should be collected for the content analysis. A guideline is that only enough data should be collected so that it contributes enough new observations and information to make it worthwhile (Moilanen & Roponen 1994). Other features of valid data are the following (Mäkelä 1990): 1) the importance as well as the social or cultural status of the data, 2) the coverage of the data (the results are not based on single observations). Besides these things, Mäkelä (1990) emphasizes the adequacy of the data, similar to Moilanen and Roponen (1994). Furthermore, the results of the analysis should be able to be repeated, and a reader should be able to follow the progress in the researcher's thinking.

The data (the wilderness expressions in the narrative literature) in this work have been collected taking the most impressive works of the most impressive Finnish wilderness authors of different time periods and analyzed objectively and systematically. The selection of the narrative literature was not taken using random or systematic sampling. Thus, the data should be called a specimen instead of a sample. One may, however, name the analysis as content analysis, particularly when the data is rather large and the saturation point in the information was obviously reached. The main characteristics of wilderness and wilderness experience could have been reached using a smaller sample (see Hallikainen 1993).

7.1.2 The questionnaires

The demanded accuracy of the results and the statistical analyses has an effect on the size of the sample. On the other hand, the size of the main population does not have an effect on the sample size. The samples of typical national surveys range from 1 000 to 12 000 persons. If the aim of the study is not to obtain very exact results describing the general population, a

sample of 1 000–2 000 persons is adequate (Uusitalo 1991). Thus, the postal questionnaire in this work is adequate to reveal the most important answers to the questions that have been set. However, the use of certain statistical analyses, such as log-linear models, would have needed a bigger sample.

The partitioned sampling method in the postal questionnaire may have been a good choice, because each geographical region in Finland was represented adequately (Jyrinki 1976). Thus, one of the goals in the study, the study of the reflection of the regional identity (Fig. 1, p. 21), has been revealed to a certain degree. On the other hand, because of the biased sample, the results cannot be generalized completely to reflect the population. However, the small differences in most of the opinions and attitudes between the respondents of different parts of the country, increase the possibility to generalize the results.

The sample of the postal questionnaire consists of eighteen years old or older persons. The age limit was set to ensure adequate stability in the opinions and attitudes of the respondents. The limit did not, however, work perfectly. In certain cases someone besides the intended sample person answered the questions. These few young respondents have, however, been included in the data. On the other hand, no age limit was set for older people, because the oldest people in our population may have seen our country in, or at least near, its natural condition.

The sample of Questionnaire 2 is not a random sample in its true statistical meaning. Although the persons were not selected consciously, the places of the data collection were selected. Thus, one should be very careful in the interpretation of the differences between the certain groups as well as in making generalizations about the main population. A random sample of slide watchers would, however, be hard to obtain. A possibility might have been to print the pictures on a paper and send the paper to a random sample collected from the population. But the tiny pictures may not have represented the scenery as well as the slides did. On the other hand, some researchers have collected rather successful data using even black-and-white paper prints (e.g. Hultman 1983a, and 1983b Savolainen & Kellomäki 1981). However, the advantages of the slide method have been recognized (e.g. Daniel & Schroeder 1979, Saastamoinen 1982). The collection of the data in most of the former landscape preference studies has been based on the use of certain groups, for example students or the other defined groups (e.g. Daniel & Boster 1976, Savolainen & Kellomäki 1981, Saastamoinen 1982, Hultman 1983a, Pukkala et al. 1988, Karjalainen 1996b).

The slides were presented one by one. Using this method, some problems were encountered. A previous picture may influence the evaluation of the next picture, and the criteria in the evaluations may change during the show, especially if the number of slides is enormous. The absolute maximum number of slides should be about one hundred pictures (Daniel & Boster 1976). Furthermore, the pictures cannot be compared with each other

if they are shown one after another. Thus, it may be difficult to say if one of the views is better than the others. Different techniques have been developed to solve these problems. As an example, a researcher can show a pile of photos to a person and ask him or her to order the photos from best to worst, or two pictures can be compared with each other at a time. In the latter method, a respondent may be asked to tell using a certain scale how much better the best of the two pictures is (Katila 1987). Furthermore, the eigenvalue method (also called the Analytical Hierarchy Process or AHP, developed by Saaty 1977) can be used in the latter mentioned approach in the treatment of the formed matrix (see Kangas 1992, Kangas et al. 1993). However, the large number of the photos made it difficult to apply these alternative methods at the time of the study. At present, the methods have been developed to make comparisons of the pairs of photos easier. All the possible pairs are not needed to compare with each other in the new variance component modeling (Alho et al. 1996). On the other hand, the random order of the slides, as used in this work, may reduce the effect of a previous picture on the next one as well as the problem of the changing criteria.

The questions in Questionnaire 1 were regarded as rather easy. The result were obtained by drawing up rather uncomplicated, even dichotomous questions and asking relatively few questions. The dichotomous questions are, however, completed with some additional, open-ended questions in order to reveal the arguments for the opinions. However, the validity of these "black-and-white" questions may be questionable. One may ask if they measure the real attitudes or opinions. On the other hand, a rather simple questionnaire was the only alternative since the respondents consisted of a very heterogeneous group of people, and the researcher could not give any extra information like he could during face-to-face interviews (so-called informed questionnaire, Eskola 1975). The reliability of the questions could have increased using more so-called control questions (Valkonen 1984). This would, however, have increased the length of the questionnaire and reduced the number of the returned forms. The questions in Questionnaire 1 should have been translated into Swedish. There were, however, only three respondents who set the translation as a condition to their answering in the second turn of the postal questionnaire when it was asked. This is the reason why the work was not done.

The questions in Questionnaire 2 were a little more complicated than the questions in Questionnaire 1. The presence of the researcher in the data collection made the use of the more complicated questions possible. Many questions existed in both questionnaires, because the second questionnaire was partly a control for the first one. Some additional questions about the outdoor recreation of the respondents were added in Questionnaire 2 to give some additional understanding to this rather poorly studied issue, in spite of the problems in the generalizing of results. The questions in the latter men-

tioned questionnaire were regarded as rather easy. Even very old persons, school children as well as lower educated persons did not have any difficulties in answering the questions without the researcher's help. Furthermore, the used scale from zero to ten as well as the form for the slide evaluation worked rather well. The questions about the scale or the form itself during the slide presentations were few, and the respondents expressed their opinions actively by putting the numbers on the paper. The respondents were interviewed as a group after the presentations. The main criticism that some of the respondents expressed, concerned the similarity of some slides as well as the difficulty in choosing the numbers near each other in the middle of the scale. Furthermore some of the respondents asked why there were so many slides in the presentation. They felt a little exhausted although the presentation took only twenty minutes.

Finally, let us look at the questions closer based on the question classification by Eskola (1975). Eskola divided the questions into four different categories: there are questions that measure 1) exact facts, 2) estimated facts, 3) motives that cause certain behavior, and 4) attitudes and values.

The questions that reveal some of the background of the respondents belong to the fist class in the latter mentioned classification. These questions worked rather well, except the question about the socioeconomic status of a respondent. Many of the respondents did not know their socioeconomic status. This is why the status was classified using the classification of socioeconomic status based on occupation classes made by the Statistical Center of Finland (Tilastokeskus 1987). The occupation of some of the respondents had to found out by using the register located in the Statistical Center of Finland. Despite the work, the socioeconomic status remained unknown in five percent and occupation in twelve percent of the cases. The question of the size of a respondent's household in Questionnaire 1 worked poorly. Besides, the question was estimated as rather uninteresting in the explanation of a person's behavior or attitudes. Thus, the variable was not used in the final computations. As a whole, the questions that measured the exact facts were rather simple. They did not include any sensitive things and could be regarded as reliable (Valkonen 1984).

The reliability of the questions that measure the estimated facts is not as high as the reliability of the questions belonging to the group measuring the exact facts (Valkonen 1984). Rather many questions like this were, however, included in the questionnaires. As an example, the respondents were asked if they have visited wilderness or not. In the question, one may criticize the lack of the alternative of 'I cannot say'. This alternative was not included because the idea was for the respondents to separate their nature visits into visits directed to wilderness environments and visits directed to "common" nature. Thus, a respondent was forced to recall his or her nature visits and if he or she had experienced wilderness during one of these visits. The naming of an area may increase the reliability of the answer. Asking the

municipality, or the municipalities, of an area in Questionnaire 1, would have made it easier to localize the area. This was done in Questionnaire 2. Another example of the questions belonging to this group is the question of the duration of a respondent's typical wilderness visit as well as the number of kilometers traveled for wilderness visits during a year. The answers to these questions inevitably give a very rough understanding of the phenomenon. The latter mentioned question may, however, reflect at least some of the respondent's attitude towards wilderness. Furthermore, the question of the duration of a typical wilderness visit may give some valuable information about the proportion of the "long tour hikers" as well as the importance of the wilderness areas to those people who visit only the "edge of a wilderness" or get their experience in small areas of wilderness. More detailed information about the nature visits of the respondents was requested in Questionnaire 2 to complete the knowledge about the phenomenon.

The estimation of the first, second and the third most important activities is the last example of the questions that measure estimated facts. One may face many serious problems in the estimation of the importance of the activities. As an example, does the importance mean how the time during the visits has been used, or does it mean that a certain activity is the most appreciated or liked activity? On the other hand, it is obvious that the most appreciated activities usually get the biggest share of time, but it is not necessarily so. As an example, a person may appreciate fly-fishing more than the other activities that he is doing in nature. However, the suitable period for the fly-fishing is rather short. As a result, the person is mostly doing something else during the nature visits. The definitions should have been done more accurately in the questions. The best interpretation of the result in this study may be that the primary activity means the activity that dominates in a respondent's memories.

The question about motives belongs to the third category. The alternatives to choose were constructed using Driver's (1983) classification of wilderness motives. Certain motives that have been mentioned as a group in Questionnaire 1 were deleted, and some motives added in Questionnaire 2. Besides that, a respondent was left to define the other motives, if she or he could not find the right ones among the ready-made alternatives. The frequencies of the ready-made and the respondent's own alternatives are not obviously comparable with each other. It would be interesting to ask the motives using an open-ended question. The difficulty to recognize the reasons for nature or wilderness visits reduces the reliability of these results. Furthermore, the "real" motives may differ from the verbally expressed ones.

Rather many of the questions, such as the question about the extent of the wilderness areas, the question on retaining the wilderness and that on wilderness conservation as well as the contingent valuation question measured a respondent's values or attitudes towards the wilderness areas. The reliability of the questions like this may be rather low. Lowe and Rüdig

(1986) have said that a person's real attitudes emerge only in connection with the conflicts that the person meets. Thus, "general" attitudes like these may not be very deeply rooted. Furthermore, Clark (1977) emphasizes the difficulties that are met in measuring the attitudes because of the problems in the definition of the concepts, and points out that a person's attitudes and behavior may differ remarkably from each other. Thus, these results should be trusted only with cautions. On the other hand, the questions were regarded as rather easy and answered conscientiously. The question of the importance of retaining the wilderness areas in Questionnaire 1 was dichotomous (retain or not to retain). This question in particular, gives only rough information about the feelings of hate or love towards the wilderness areas. The open-ended question about reasons for wilderness preservation or conservation, however, gives much more valuable information about the attitudes.

The contingent valuation question measures a person's attitude towards wilderness preservation as well as the tool to support the preservation. The question that has been used in this study is a rather rough application of the contingent valuation method, in a way a basic form of the method. One of the biggest problems of the method is the measurement of the intention, not the behavior itself. Mitchell and Carson (1989) have discussed the possibilities to diminish the problems that are involved in the method. The question about a respondent's willingness to support wilderness preservation by signing a petition has not been used very much before. Thus, it is an experiment.

The questions that measure the respondent's mental images can be placed on a level with the questions that measure a person's attitudes and values. The definitional perception question (Heberlein 1982, Hummel 1982) in both of the questionnaires and the question on the size of a wilderness area as well as the estimation of the wilderness character of sixteen verbally described forest stands in Questionnaire 1 were questions like this. Many of the respondents found it rather difficult to answer these questions. The verbal descriptions in the two latter mentioned questions were tried using neutral words and avoiding "guidance" in the wording of the questions. Some of the respondents, however, claimed that the questions were leading their thoughts according to the researcher's will. On the other hand, Himmelstrand (1961) and Eskola (1975) have thought about the problem and came to the conclusion that the "guidance" like this in the attitude studies is not very serious if it does not change the order of the units in the measured attitude dimension. The validity and the reliability of the questions may be questionable. The questions were, however, used to test the method. This means that it is interesting to compare the results with those of the slide show. The results of the question dealing with size a wilderness area should be tested somehow in the future. At its best the question can give only some guidelines about the desired size of a wilderness.

7.1.3 The problem of non-respondents

The proportion of non-responded persons in the postal questionnaire was quite considerable. Particularly in the rather old sociological literature, the authors mention that one may expect to receive from about 65 to 90 percent of the posted forms back (Eskola 1975, Jyrinki 1976). Although the number of questionnaires is nowadays rather high, and people might not have the energy or interest to answer all the questionnaires, some forest researchers have achieved almost the latter mentioned proportions (e.g. Salo 1984, Salo 1985, Kangas 1992). For example, Salo's questionnaires about the collection of wild berries or edible mushrooms can be compared with this study, because the data in Salo's works have been collected by using random sampling, and the main population does not consist of any special group. The proportion of answers in Salo's studies ranged from 65 to 76 percent. This proportion might have been remarkably higher if the main population consisted of some specialized people. As an example, Saastamoinen (1972) received 96 percent of the forms that he sent in his study that were directed towards recreational users of the Saariselkä area (nowadays Urho Kekkonen National Park). In addition, in the latter mentioned questionnaire, all the people who received the questionnaire had been interviewed in the wilderness area.

Brown et al. (1989) have studied the returned proportions of the sent questionnaire forms in a sample of recreational studies. The study reveals that the proportion varied from 42 to 90 percent, the mean value being 72 percent. The sample consisted of 38 surveys that were directed to ordinary people as well as some special groups. The researchers have identified some features that have an effect on the proportion of returned forms. The features are the following: 1) the saliency of the survey and the object of the study (ordinary people, some special groups, the increase in the percent may be about 20 percent); 2) the number of pages of the questionnaire (increasing number decreases the percent); 3) the length of so-called hypothetical questions (each inch decreases the percent by 0.79 percent); 4) the season (the worst seasons for responses are summer months and December) and 5) the size of the font used in the questionnaires (larger fonts increase the percent of returns).

Dolsen and Machlis (1991) have studied whether the survey results of homogenous recreation populations can be valid at lower response rates. Their main result was the following (p. 1): "No substantive reason was found to reject results with a response rate of 65 percent compared to the response rates of... 86 percent. Rejecting study results with response rates in the range of 35 to 50 percent may be justifiable". Thus, without the support of the rather consistent results in the telephone interview with the results in the postal questionnaire, one should consider the rejection of the results in this questionnaire, or at least one should interpret the results with cautions.

This questionnaire was sent in May, rather near the summer vacation to a sample of ordinary Finnish adults. Although the questionnaire was rather short and there were not very many questions, many of the questions were rather long and hypothetical. These things may reduce the proportion of returns. Furthermore, the contingent valuation questions may reduce the proportion remarkably. Loomis (1987) has noted that economical surveys that include a contingent valuation question, or questions, often result in only a 40–45 percent response rate. On the other hand, the percent in Kriström's (1989) contingent valuation study was 66.

The high proportion of non-respondents has an effect on the interpretation of the results, particularly if the phenomenon is systematical. This means that some important features of the non-respondents differ from the features of the respondents. If this is the situation, the results could not be generalized. On the other hand, the group of the non-respondents is seldom randomly formed. For example, a respondent's age, education and interest in the subject have an effect on the respondent's willingness to return the questionnaire (Jyrinki 1976). The distributions in this postal questionnaire give some evidence that older, often lower educated respondents have answered more seldom than the younger and often fairly highly educated persons.

To conclude the previous discussion about the factors that may have had an effect on the respondents' activity in answering the questionnaires, the following six things obviously had an influence on the rather low proportion of returned questionnaires:

1. The lack of the age limit among the older people.
2. The strangeness of the issue, not very important issue to many people.
3. Poor season to send the questionnaire.
4. The questionnaire included rather many hypothetical questions.
5. The questionnaire did not differ sufficiently from other questionnaires.
6. Language problems.

The reminder letter that was sent to the respondents increased the proportion of returns remarkably, by about fourteen percent. However, this increase is a little lower than Jyrinki (1976) mentions. Christensen (1982) mentions that a brief reminder should be sent if the respondents are not homogenous. Furthermore, the second reminder letter is sometimes sent to increase the proportion of about half of the increase after the first reminder. In this study, the second reminder was not sent because of the expense in regard to the advantage, and because of the season.

Before the results of the questionnaire are generalized, one should ask if the attitudes of the non-respondents towards wilderness are different from the attitudes of the respondents. The results of the telephone interview in this study are evidence that the non-respondents took a positive attitude towards wilderness as well as towards the preservation of wilderness. Thus, at least the results for the existence of the wilderness areas and for the appreciation towards the areas can be generalized to the main population rather well.

7.1.4 The statistical methods

Most of the statistical methods that have been used in this work are ordinary methods that have been commonly used in analyzing survey data like these. However, there are three things that have to be discussed more closely, 1) the scales that have been used in measuring the phenomena, 2) the particular features in many of the distributions, and 3) the interdependencies between the answers.

Most of the data are *categorical data*, or the variables have been measured using the *ordinal scale*. This restricted the use of statistical methods. Thus, the role of non-parametric methods was emphasized. Although many of the methods, such as the log-linear models that have been used in analyzing the interdependencies between the groups of the respondents, are powerful in revealing the interdependencies, the size of the data restricted the use of the methods. The use of the Monte-Carlo estimation increased the reliability of the p-values of Pearson's, as well as log-likelihood chi-squared tests (Mehta & Patel 1995). However, despite of the methods, the problem of only few observations in certain categories remains.

There are two approaches in building models in which the values of a binary response variable are explained (or predicted) using a set of categorical variables: 1) logistic regression models and 2) multinomial logit-models that are based on the multinomial theory and assumptions. The latter models are a special class of log-linear models (Agresti 1990, Norušis/SPSS Inc. 1997, SPSS Inc. 1997). The multinomial logit-models can be applied in situations where the response variable has more than two categories. In this work, multinomial logit-models have not been used. Instead, logistic regression models have been used by coding the responses as binary responses, because of the possibility to test the significance of the terms in the models using the likelihood ratio statistics in SPSS statistical package.

A problem that arises in the use of ordinary scales is the proximity between the values in a scale. One cannot be convinced that the proximity is the same from one value to another. However, in the computations, the assumption of the similar proximity is often set, particularly when certain parametric methods, such as the mean of the values or Pearson's correlation coefficient are used. On the other hand, Rannikko (1977) claims that many experiments have given some evidence that the distortion in the scale does not seriously restrict the use of the variables that have been measured using an ordinal scale in the multi-variate analysis, such as a factor analysis that is based on a correlation matrix. The proximity between the values of the ordinary variables was considered carefully in this work, especially in the interpretation of the scenic scales as well as the five point Likert scale. The scales were interpreted as ordinal scales, and this selection was reflected in the choice of the statistical methods (see Golbeck 1986). On the other hand, some researchers such as Daniel and Boster (1976) as well as Pukkala et al.

(1988) have used the statistical methods for continuous scales in the computations of data like this.

Many researchers (e.g. Daniel & Boster 1976, and Pukkala et al. 1988) have used nine or ten point scales in scenic judgements. Thus, the eleven-point scale that has been used in this work may be comparable with the other studies. However, Daniel and Boster (1976), Daniel and Schroeder (1979) and Haider (1994) have discussed the need to standardize the rankings. These researchers have developed a so-called Scenic Beauty Estimation (SBE) method to make individual scales uniform and comparable with each other. Some people may actually use a wider range of the scale than others. Furthermore, the zero points in the scale may not be the same from between observers. On the other hand, some other researchers (e.g. Pukkala et al. 1988) have not standardized the rankings by the SBE-method. In this work, the rankings have not been standardized because the different amplitude as well as the base level in the rankings was believed to reveal interesting information about the "true" dissimilarities, especially between the groups of the respondents.

Sometimes the identification of the used scale may be difficult. As an example, the environment of a respondent's residence in this work is a typical categorical variable with categories like city, village and countryside. On the other hand, one may interpret that the scale is an ordinal one with a growing rural degree. The classification of a respondent's socioeconomic status is another example. Some of the categories in the latter mentioned variable can be ordered, and some of them cannot. A possibility to solve the problem is to re-code a categorical variable using dummy-coding producing new variables (Rannikko 1977, Valkonen 1984). In this work, dummy-coding was used in the question of wilderness and nature motives and activities as well as in the study of a respondent's preference to stay overnight in wilderness areas.

The *distributions* of most of the variables that were used in this work were skewed. The skewed distributions were found particularly in the variables of the questionnaires, but many distributions of the continuous variables describing the characteristics of the forest stands were highly skewed as well. Furthermore, the interdependencies between many of the forest characteristics were not linear. These features in the data recommended choosing the Spearman's rank order or polychoric correlation coefficients as a tool in the computation of the correlation matrix for the certain multi-variate analysis. The latter mentioned correlation coefficients were used in spite of the fact that some researchers, such as Labovitz (1967) and Borgatta (1968), have found some advantages in the use of the parametric methods like Pearson's product moment correlation coefficient, even in the situations of the violated assumptions in the distributions or linearity. On the other hand, in spite of the fact that especially the polychoric correlation coefficient have been developed to avoid the effects of the violations in the

use of the parametric multi-variate methods like factor analysis (Leskinen 1987, Jöreskog & Sörbom 1988), one has to remember that factor analysis itself is a parametric method. Rannikko (1977) has mentioned that the main aim of the multivariate methods is not the estimation of the correlation coefficients but the parameters of the multivariate methods. Thus, the values of the parameters may be violated although the values of the correlation coefficients were not. The effect of the violated assumptions on the results of exploratory factor, or main component, analysis is obviously not very serious compared with the testing of the confirmatory factor analysis models (Leskinen 1987).

Because factor analysis and principal component analysis are rather exacting parametric methods, multi dimensional scaling (MDS) or cluster analyses were sometimes used instead of the former mentioned analysis in this work. The latter mentioned analysis was used as a control to factor or principal component analyses as well. In MDS, conditions in the distributions or linearity of the variables are not set. Instead of the metric ratios between the variables, the ordinals may be used in the computation (Orloci & Kenkel 1985, Golbeck 1986, Minchin 1987, Ranta et al. 1989).

The third statistical problem in this work has been the question of *independence of the answers* (variables). None of the answers in a questionnaire is independent in the real meaning of the word because the same person has produced the answers. An answer may have an effect on the following answer. The theory behind many statistical methods, such as correlation, is based on the assumption of independence. Thus, the correlation coefficients between the variables describing the attitudes of the respondents could not be computed. However, very many of the social scientists who have used surveys in their work, have used factor or principal component analyses that have been based on a correlation matrix in "extracting" the information in a "statement battery" (see e.g. Sänkiaho 1974, Rannikko 1977).

Furthermore, the use of Pearson's chi-square test in order to find out the difference between the groups of the respondents in their expressions used to describe wilderness is questionable. This is because a respondent can produce many words to define the concept (so-called multiple response). Although the responses are not independent, the groups of the respondents are. Thus, one should imagine the situation as a test between the certain "expression bowls". The differences between the "bowls" do not, however, necessarily prove that the images of wilderness are different between the groups. One group of the respondents may be verbally more productive than another group! Other difficulties that this lack of independence can cause to the estimation of statistical probability are worth of thinking about. However, Heberlein (1982) has used a rather similar definitional perception question in his work and used certain multi-variate methods in the grouping of the expressions.

Some researchers (e.g. Daniel & Boster 1976, Kellomäki & Savolainen 1984, Pukkala et al. 1988) have tested the similarity between two judgements of the same objects made by the same observers using a correlation coefficient. The objects may be presented using different techniques such as color slides, computer graphics or nature visits. The assumption may have been that the two judgements are independent although the same persons have made them or the possible lack of independence has no practical effect on the results. On the other hand, Daniel and Boster (1976) have also used different samples of people in each of the judgements of the same object presented by different means and compared the results using one-way ANOVA. Thus the samples are completely independent. However, some problems may arise if the results of the judgements are different. In this work, Spearman's correlation coefficients between the slide and field judgements have been used as well. However, the main study in the evaluation of the similarity in the two judgements has been made using the reliability analysis of Cronbach's alpha (e.g. Mueller 1986, DeVellis 1991, Norušis/ SPSS Inc. 1997).

7.2 Discussion about the results

7.2.1 Discussion about the concept of wilderness and wilderness experience

The concepts of social wilderness and wilderness experience have been closely linked together. Wilderness has been defined by visual, the auditive and odorative experience in the *definitional perception question* (Hummel 1982). Besides the scenic properties, such as old virgin forests, lakes, rivers, ponds and mires, the experience of peace and silence and some odors came into the respondents' minds when they were asked to define wilderness. The definitional perceptions of wilderness that have been defined by the respondents of both of the data sets is rather similar to the mental images arisen by the narrative literature that have been used in this work. The definitional perception question may produce rather spontaneous mental images of wilderness. The images do not necessarily have any spatial connections. Furthermore, it is remarkable that the images appeared to be very similar in the two data sets.

The mental image of Finnish wilderness is a rather untouched, remote, uninhabited and roadless forest area, broken into shivers by mires as well as by river and lake systems. These wilderness features obviously carry ancient cultural meanings and values that have been emphasized in Chapter Two. These meanings and values have to guide wilderness management as the standards beyond the standards (Manning 1992). The strongest wilderness culture in Finland developed in the inner southern part of the country (Voionmaa 1947). The backcountry areas outside inhabited rural areas re-

sembled the images that rise from the Finnish consciousness. It is notable that although our statutory wilderness areas are situated in the northernmost part of the country where fells often dominate the landscape, the latter mentioned ecosystems do not dominate the spontaneous wilderness images of the Finnish people. On the other hand, most of the respondents regard those vast wilderness areas as well as the other vast northern nature conservation areas as wilderness when they visit there. Our mass media, and particularly some hiking guides (e.g. Kemppinen 1966), strongly emphasize the role of the northern fell areas as wilderness. Furthermore, the role of game and fish is still present in the wilderness images, but the role may be gradually decreasing with the growing hiking and trekking culture.

It is remarkable that only some of the respondents mentioned that the number of encountered people in wilderness has to be small. The problem of crowding may not be very serious in our wilderness areas. Rather, the social interaction to a certain extent is desired. Even in the popular wilderness area of Urho Kekkonen National Park (UKNP), the visitors only occasionally feel their social capacity exceeded (Saarinen 1995a, 1995b). In a study of Saarinen, (1996) about one-third of the visitors in UKNP wanted to become acquainted with other visitors in order to share the experience. Thus, it is evident that the wilderness visit is a social event to a certain extent, reflecting perhaps the ancient hunting traditions, in which groups of hunters co-operated in order to catch game. The situation is rather different in the United States where crowding in wilderness areas is a remarkably bigger problem (e.g. Graefe et al. 1986, Cole 1990).

The expressions produced by the different groups of the respondents are rather similar reflecting perhaps rather similar cultural backgrounds. However, some understandable differences have been found. Rather young, urban and educated person's emphasize the features of clean, unpolluted, untouched, wild animals, uninhabited and silent in their wilderness images. Thus they consider wilderness strongly as an opposite of their daily life environment, as the opposite of cities (Tuan 1974, Keisteri 1990). On the other hand, the countryside dwellers who are often older and lower educated emphasize remoteness and virgin forests in their images. These images may reflect the reality during their childhood. Despite the spontaneous images, the other measures in this work reveal that the older people as well as the countryside dwellers obviously tolerate more changes in the wilderness environment compared with the young and often urban respondents. One has to remember that many of these older, rural people have lived through the biggest changes in our nature and society. However, in Finland, the cultural differentiation between rural and urban is not very abrupt. Until present days, the countryside has had a strong effect on our "city culture" (Allard & Littunen 1979).

The expressions, "untouched" or "the area in its natural condition" are rather complicated to interpret. Wild animals are one dimension (indicator)

of the natural condition (Lucas 1990a). Thus, it is understandable that wild animals have been emphasized by those respondents who emphasized the natural condition of wilderness areas. On the other hand, the image may be due to little personal contact with wilderness, and all the time the growing influence of the "secondary uses" (Lucas 1990b) of wilderness may highlight the role of the wild animals. Moreover, Stankey and Schreyer (1987) point out that personal contact with wilderness as well as reliable information about wilderness has a strong influence on the mental image. Those persons who have visited many of the wilderness areas, do not overestimate the natural condition of the areas. Man's close connection with our forests from the past to the present day can widely be seen in nature, and methods have been developed in order to estimate a forest's naturalness (Lindholm & Tuominen 1993). So-called "true" virgin forest may be hard to find, at least in the southern part of the country. Furthermore, some authors, such as Koskimies (1995), have pointed out that overgrazing by reindeer threatens the natural state of the northern wilderness areas.

An interesting feature in the expressions was the proportion of the positive expressions (see also Appendix 4). As it has been discussed in Chapter Two that wilderness has always been important to Finnish people, as "the storehouses of the backyard" (Hallikainen 1994). Thus, wilderness has not been an evil or bad thing, an object to win, tame or change to something else, as it has been in the Anglo-American heritage (e.g. Nash 1982, Short 1991, Manning 1992). Despite of the fact, certain groups of the respondents, such as those who regard the extent of wilderness area as too much, define wilderness using somewhat more negative expressions like "remote" compared with those who wish for a greater extent of wilderness areas. Furthermore, the first mentioned group does not specify the forest or mires as accurately as the latter mentioned group. This may indicate a higher tolerance towards activities that change nature in wilderness areas by the first mentioned group.

Heberlein (1982) and Hummel (1982) have used the definitional perception question in their studies directed to American students. In the first mentioned study, the expressions characterizing wilderness were in the following descending order: trees, animals, green, birds, beauty, silence, water, solitude, forest and peace. Thus, despite of the many similarities, the main differences compared with the Finnish expressions were the lack of the expressions of roadless and uninhabited among the most often mentioned characteristics in the American study. Furthermore, the natural condition of the areas was not emphasized, and forests were not defined in the expressions. In Hummel's study, the most often mentioned expressions were the following: forests (57 % mentioned), untouched (45 % mentioned), animals (36 % mentioned), water (23 % mentioned) and nature (21 % mentioned). The results of the latter mentioned study are pretty close to those of the Finnish data, although the natural condition of the areas may be slightly underesti-

mated, particularly the characteristics of untouched virgin forests have not been emphasized in the American study.

The second step towards the understanding of the Finnish concepts of wilderness and wilderness experience was the use of the hypothetical questions. This means the questions that verbally describe a forest environment. As mentioned earlier, these questions were considered as difficult to answer, particularly the question of the minimum size of wilderness when the areas have been managed using different forestry schedules. The result of the question indicate that although many of the respondents emphasized the extent of the roadless wilderness areas covered with virgin forests, about a third of the area that has been mentioned as a minimum for a wilderness area according to the Finnish Wilderness Act (Erämaalaki 1991) is enough for half of the respondents to satisfy their wilderness experiences. Furthermore, the so-called "eight kilometers definition" (wilderness begins after an eight-kilometer walk from the nearest road, see Häyrinen 1984) is rather strict leaving out many of the areas that have been referred to as wilderness in this work. Only a minority of the respondents demand areas of this size for their wilderness. If the forests of an area, or a remarkable part of the area, have been recently cut, an increase in the size of roadless, uninhabited area cannot compensate for the loss in the wilderness experience. An application of this result is that timber transportation from a forest area along unnoticeable winter tracks may not retain an area's wilderness character. On the other hand, most of the wilderness experience will be lost when the net of the visible roads ("summer tracks") have been built for timber transportation in a virgin forest area. However, the effect of the roads on the experience would need the use of more advanced methods than postal questionnaires.

It is surprising that those respondents who live, or have spent their childhood in Lapland do not demand vaster wilderness areas or more sparse road networks than those who live in the other parts of the country, because the vastest roadless areas in their natural condition are situated in northern Finland. An explanation for this may be the fact that the Lapland dwellers are very interested in hunting or fishing or collecting wild berries or mushrooms. Roads do not interfere with these activities very much.

The use of the verbal description in assessing the wilderness character of a forest stand produced astonishingly consistent results with those obtained by showing the slides. The results suggest that certain forestry activities, such as slight thinning, can be applied without loosing the opportunity for certain wilderness experiences. However, all the methods that have been used in this work suggest that the forest stands in the beginning of their succession do not promote wilderness experience. The size of a young stand may, however, affect the experience.

The question about the effect of the verbally described forest stands on a person's wilderness experience did not distinguish between tree species. Thus, the results suggested that old spruce- and pine-dominated forests are

equally valuable for wilderness experience. However, the results of the slide show revealed that spruce-dominated forests have been considered more wilderness-like than the pine-dominated forests. It is understandable because matured pine forests are luminous, and it is easier to be orientated and roam in these forests. The features like snags (old dead trees) as well as old, thick pines increase the wilderness character of the pine forests. Thus, virgin pine forests are an important part of the Finnish wilderness. First of all, pine forests have been regarded as beautiful and suitable for outdoor recreation. This result in this work is consistent with the results of many previous studies (e.g. Savolainen & Kellomäki 1981, Kellomäki & Savolainen 1984, Pukkala et al. 1988). The same can be said about "pure" birch forests.

Otherwise young pine-dominated forests, rather young spruce forests obviously carry a lot of wilderness character. As it has been presented in Chapter Five (Fig. 2), spruce-dominated forests are denser than the pine forests. Furthermore, compared with the pine forests, the spruce forests are characterized by a bigger volume of stock, bigger diameter of tree stems, smaller number of stumps and a smaller coverage of slash. These things may have had an influence on spruce forests' higher wilderness character.

Dense spruce forests may often be gloomy, and sight in these forests is highly restricted. Thus, a spatial analysis and orientation may be difficult inside a spruce forest, and one may easily get lost. As the results in this work suggest, getting lost may be an important part of the wilderness experience. The experience of getting lost may be the Experience in the meaning of Heidegger's (1927) philosophy. The tearing feelings of fear and homelessness that may came to mind when a person's "mental mapping" does not work, and the person feels to be lost in a dense and gloomy spruce forest. This feeling may be near the experience described by Vattimo (1989). When the "mental mapping" is difficult, a person's imagination has an opportunity to work (Kaplan & Talbot 1983). This may occur particularly in spruce-dominated forests, even in rather small areas. Besides this study, many former studies suggest that the spruce-dominated forests have not been regarded as beautiful as pine- or hardwood-dominated forests (Savolainen & Kellomäki 1981, Kellomäki & Savolainen 1984, Pukkala et al. 1988).

Above all, a great number of snags, the volume of tree trunks, as well as a high age of the trees are the features in the landscape that promote wilderness experience. These are the features of a forest in its natural condition, the features in the end of the forest succession. As stated before, although the concept of naturalness is many-sided and difficult to define (see also Wohlwill 1983), it is evident that old trees, and particularly snags, are an indispensable feature of a natural forest, and thus wilderness. Perhaps the most extreme concept of wilderness forest has been expressed by A.K.Cajander, the famous Finnish forest researcher. According to him, the only wilderness forest that he had ever seen was located on an island in the Lena River in Siberian. The forest had not been burned, and thus it was very

old and full of dead trees (ref. Keltikangas 1984). Although it is evident that at least nearly all forestry activities reduce wilderness experience by a certain degree, a forest manager should leave as much as possible the oldest trees and snags in a forest cutting area to exemplify wilderness (the concept of exemplification, see Kalanti 1990). Although there are recommendations to leave at least some single trees and groups of trees in the cut areas (e.g. Metsähallitus 1991, 1997), the economic aspects may prevent the leaving of the wilderness symbols in a cut forest. These symbols may be economically the most valuable trees in the forest.

The discriminant analyses that have been used besides the principal component analysis in order to find the physical features in the forest promoting scenic experience may be valuable for practical purposes. However, only the function for predicting the wilderness character of a forest stand proved to be powerful enough in predicting the character in three classes. The independent variables in the model were almost the same as the ones that have been noted to promote wilderness experience in the results of the principal component analysis. If we know the basal area of the tree trunks, the median age of trees and the maximum diameter of standing dead trees, we can classify the forest stands in the efficiency of eighty percent as "non-wilderness", "medium" and "wilderness" like stands, and perhaps draw a map. One should, however, be cautious about the functioning of the model before testing the model in other independent data. Another approach would have been the construction of a regression model, in the way that Pukkala et al. (1988) have done.

In some studies (e.g. Savolainen & Kellomäki 1981, Kellomäki & Savolainen 1984, and Axelsson-Lindgren 1991), the role of the old, untouched virgin forests in producing positive experiences has been questionable. In general, the forests have not been regarded as beautiful or homelike. However, the results in this study suggest that old virgin forests are appreciated as rather beautiful landscapes in addition to the wilderness experience they promote. Furthermore, if the idea of old virgin forests as an archetype (Reunala 1987) is true, these forests are very valuable as a source of particular experiences.

The characteristics of the wilderness forest, or the other wilderness landscape, that have been noticed in this study, fit rather well with the seven characteristics that Ulrich (1983) have listed as the features of a "pleasant scenery". However, some of the characteristics differ from the characteristics of wilderness-like forests. As an example, a wilderness-like environment may be demanding to access, the landscape may be poorly outlined, even confusing, the length of sight may be rather restricted, a landscape may include certain threatening elements and a watercourse is not necessary for wilderness experience. Thus, one of the main questions is: is it possible that a "good" landscape consists of some unpleasant elements? The answer may be "yes" if we regard a wilderness landscape as a "good" landscape. At

least the division of landscapes into "good" or "bad" is insufficient (see also the further discussion about the amenity values of mires in this study).

Forest stands in the beginning of their succession do not have very many amenity values (wilderness character, scenic beauty and so on). Clear-cuts and 'closed' young pine and spruce stands (from 15–30 years of age) have been regarded as the least attractive stands, in general. Particularly, the soil preparation activities, such as plowing or harrowing done after cuttings, reduce the attraction of the stands (e.g. Haakenstad 1972, Saastamoinen 1972, Loven 1973, Kellomäki 1975, Savolainen & Kellomäki 1981, Kellomäki 1978). The main features of these results have been repeated in this study as well, although some other features besides a forest's age, characterizing a forest's succession stage or mightiness (particularly diameter and volume of stems), proved to correlate the strongest with all the amenity values that have been measured in this study.

Stumps and slash have been noted to prevent scenic beauty in this study, as well as in some of the previous studies (Löfström 1987). Thus, slash has been recommended to be removed from the forest regeneration areas near towns or other urban settings (Komulainen 1995, Metsähallitus 1997). This work is very expensive and cannot be done in vast and remote commercial forests. Stumps should be made as unnoticeable as possible as well. This is important, because slash and particularly stumps decrease a person's wilderness experience even more than the experience of scenic beauty.

In addition to the earlier mentioned preference studies, a recent Canadian study (Boxall et al. 1996) provides interesting comparisons with the Finnish wilderness features in spite of different methods and nature conditions in the Canadian study compared with this study. The results of the Canadian study suggest that landscape or scenery attributes were rated most important by the wilderness recreationists when the importance have been studied using photographic images. Moreover, of the predominate vegetation of the area, jack pine stands were rated highest followed by mixed predominantly coniferous stands. Furthermore, the recreation users' valuations of management features have been studied by defining recreation users' route selections. The selections reveal that mature jack pine and white spruce stands influenced positively on recreationists' selections, while mature black spruce and aspen stands as well as the presence of burned areas and cottages influenced negatively on the selections. The influence of cut blocks remained unknown, or at least problematic.

All the tests in this work suggest that *mires or other Finnish wetlands* are very important for wilderness experience, as important as the old virgin forests. Let us think for a while about why those areas have been considered as wilderness. The empirical studies revealing the attitudes of Finnish people towards mire*s* and mire landscape are very few in number, perhaps one cannot find the studies at all. Almost the same can be said about the studies in other countries. In Finland, the situation is a little confusing, because mires

or other wetlands dominate about one-third of the country, and about one half of the area has been utilized for forestry purposes in order to change the mire ecosystems into dry forest ecosystems (e.g. Heikurainen 1980). Furthermore, mires have been widely dried for cultivation (e.g. Linkola 1995). However, mires have been a necessary part of the Finnish landscape. An old Finnish man who had lived for a long time in the United States, expressed his feelings about a mire near the municipality of Multia during his summer holiday visit in Finland by saying: "This is Finland" (ref. by Laaksonen 1995, p. 106).

Many people have not considered mires to be worth studying. Runeberg, the famous Finnish author, may have supported this attitude about mire landscapes. Runeberg has been said to polarize landscape experience into "good" meaningful landscapes and "poor" landscapes, the landscapes without any meanings. Mires belonged to the latter category (Takalo-Eskola 1995). On one hand, a mire has been considered as a very bipolar landscape in Finnish art and thinking. On the other hand, wide, quaking open mires have been regarded as chilly, dangerous, gloomy, remote places, being as a symbol of the dead in an archaic meaning (Mäkelä 1995). These images have their reason. In the ancient times, people may have been sacrificed by killing them and, after that, sinking them in a mire. Although we do not know the details, old but well-preserved corpses have been found in some mires (Mäkelä 1995, and Laaksonen 1995). Moreover, mires and the other wetlands have been a difficult obstacle to a humans' well being in Finland. The fight against cold, frosty, wet areas during the time of expanding agriculture, has left its ineffaceable marks in the Finnish soul (Mäkelä 1995) On the other hand, mires have been perhaps the most important hunting areas during the times when the natural sources of livelihood were important for survival. Particularly, in the springtime when wild birds came after long and wearying winter, mires were important hunting areas of geese, swans and the other birds as well (Linkola 1995).

The bipolar attitude towards mires can be clearly seen in Finnish art as well. Some painters, such as Akseli Gallen-Kallela (in his work "The Flower of Death", 1895) or Hugo Simberg (in his works "Autumn", 1895 or "Frost", 1895) have connected mires with things like death, withdrawal and cold. Whereas some other painters like forest officer Lennart Segerstråle (in his works "Geese", 1913 or "Cranes on a Mire", 1919) or Eero Järnefelt (in his work "Marsh Tea") have described mires rather positively. In some works, like Einari Junttila's work called "Mire Scene" (1950s), a mire has been described as a rather beautiful but melancholic landscape. According to Koskimies-Envall (1995), the descriptions of mires in Finnish are closely connected with romanticism in the way to interpret landscapes. Koskimies-Envall analyzes this romanticism in a very interesting way. She writes (p. 108, translated into English):

> Romanticism is in its deepest meaning escaping from the present times. It means longing for to something unknown, to the eternity of nature, free associations, setting intuition ahead of logic. The intrinsic nature of the mire includes the experience of the same, indefinite state, merging to the eternal cosmos, the mixture of the beginning and the end, resembling to the philosophical thinking of the age of romanticism as well as the romanticism itself during all the times. In landscape paintings, the romanticism means bringing out frightening, terrifying and shuddering motifs...as well as describing the unattainable treasures of nature in their original wildness, sinking into the thousands of years old secrets of the dark waters of a mire, putting one's soul into a state resembling a womb.

These ideas may have some important connections with the features of wilderness experience (see Chapter Two). It is understandable that mires and other Finnish wetlands are considered as wilderness because of their cultural meaning to old Finnish hunting traditions. Besides, mires may be an important and deep symbol of our souls, as an archetype like an old virgin forest. The experience on a mire may be an archaic wilderness experience. The meaning of the wetlands as a symbol of the soul has been manifested in the expression of "the wetland of subconscious mind". In this meaning, mires or other wetlands are considered as unknown and frightening but perhaps fascinating as well (Takalo-Eskola 1995). Moreover, wide open mires or bogs are a symbol of peace and tranquillity as well. Peace and tranquillity are perhaps the most important parts of wilderness experience.

Lindholm (1996) has mentioned that our mires are the most original and untouched part of our nature. Furthermore, he finds interesting psychological connections between the Finnish personality and mires. He writes (ibid., p. 72, translated into English):

> A Finnish, melancholic mire resembles the Finnish personality: it is silent, modest, mostly sad at heart, difficult to reach and soft but, on the other hand, incredibly vital and, when it has become better-known, unusual rich and many-sided, full of life, and occasionally noisy. The essential features characterizing the Finnish are reflected on the turbid, multi-colored surface of a mire. The Finnish way of living and Finnish personality have developed during the thousands of years in this country of forests and mires."

Urpo Häyrinen (1970), a researcher and nature conservationist who knew Finnish mires very well, wrote in his work named "*Suo*" (Mire) that the mires are the most original, wilderness-like areas in Finnish nature.

In some European countries, such as in Scotland or Ireland, bogs or other wetlands have not been appreciated as beautiful landscapes until during the last few years. Moreover, these areas have often been regarded as a marginal land or a wasteland. On the other hand, bogs have been an important source

of peat for warming, or they have been used as grazing grounds. Thus, since late-prehistoric times, bogs have been a part of the cultural landscape (Chambers 1997, Smout 1997, and Welch 1997). Expressions praising the beauty of bogs have been few, but some single expressions of the beauty can be found, even in the late 19th century (Anonymous 1894, ref. Smout 1997, p. 164):

> To see a sunset on Rannoch Moor is as essential as to see Loch Lomond by moonlight.

During the centuries, the bog or other wetland areas have diminished dramatically in Western Europe. As an example, in the United Kingdom about 90 % of the bog areas have been lost. Bogs have been drained, used for peat extraction, for the other commercial development or covered with forest. Only a few percent have been reserved for protection (Foss 1997, Ingram 1997). The awareness of all the functions of natural wetlands has been rising during the last few decades, but mostly during the last few years in Europe. The awareness have manifested the wetland's function in "providing the opportunities for reflection, spiritual enrichment, cognitive development and aesthetic experience" (De Groot 1992, ref. Joosten 1997, p. 414, Foss 1997). The destruction of the wetlands in Southern and Central Europe and the growing appreciation of natural wetlands may increase the recreational use of our wetlands in the future. As the results in this work suggest, we have to retain our mires for our own wilderness experiences and, probably, for the growing population of the mire enthusiasts living abroad.

Besides mires and bogs, *lakes, rivers, streams and ponds* are obviously the very important natural characteristics that promote wilderness experience, although the importance has been studied only using a hypothetical and definitional perception question. A more advanced analysis using slides, should be done in subsequent analyses. The same can be said about the importance of rocks to the wilderness experience. In the United States, the wilderness or the wild land recreation discussion and study is largely concentrated on the attraction and use of the river and lake systems (e.g. Douglass 1982, Shindler & Shelby 1992, and Whittaker 1992). Although Finland is the "country of thousands of lakes", the study of water recreation has been sparse. Some studies dealing with this subject can, however be found. As an example, Herva (ref. Telama 1992) has studied river boating and canoeing as well as the quality of the environment for these activities. Furthermore, Raatikainen and Forsström (1992) have formed water and river area mapping for physical exercise. However, the importance of the river and lake systems in Finland in order to promote wilderness experience have not been systematically studied. These studies should promote the discussion about the use and management of the shorelines of rivers and lake systems and seashores.

Sievänen (1995) has studied hikers' assessments of qualitative factors on the hiking trail environment. Ponds, lakes and rivers have been assessed as the most compatible trail environment. Bogs in their natural condition have been assessed as the second most compatible, and old virgin forest as the third most compatible environments. A dense young forest stand was assessed as rather neutral but ditched bogs, clear-cut areas and plowed forest regeneration areas have been assessed as rather negative trail environments.

The landscape preferences proved to be rather *similar between the groups* of the respondents. This is important, because in many circumstances, the value of the preference studies like this have been made questionable by claiming that there are just as many ways to experience the landscape as there are people (e.g. Reunala 1984). In part, this may be true. If we take two persons, it is possible that one of them considers a scenery as totally non-attractive whereas another as totally attractive. Thus, it would be impossible to build a landscape model that satisfies all. If we, however, take a group of people, let us say 30 people, and after that another similar independent group, it is apparent that the attitudes between the groups towards a landscape are surprisingly similar. Pukkala et al. (1988) have noticed the same thing.

Despite this fact, some differences between the groups of people have been found, in this study as well as in some other studies (e.g. Daniel & Boster 1976, Kellomäki & Savolainen 1984, Karjalainen 1996b). An interesting difference has been found in the attitudes of different age groups towards the wilderness character of forest stands as well as in the attitudes of different education groups towards scenic beauty. High school graduates considered most of the forest stands as a little more beautiful than the lower educated persons. Better cognitive understanding of the higher educated persons may have had an effect on the difference. The fact that old persons have given slightly higher scores to most of the forest stands, particularly to the young stands or clear-cuts have been noticed in the study of mental images as well. The differences in the two latter mentioned groupings are, however, only suggestive.

In some former studies, the certain groups of people, such as those who had some forestry education, have been noted to appreciate virgin forests as their recreational environment more than the other groups of people (Lane et al. 1975, and Savolainen & Kellomäki 1981). This has not been noticed in this study. On the contrary, the persons who had a forestry education, or who were working in agriculture, were the most critical respondents giving the lowest scores in the evaluations of all the scenic features of most of the stands. Doing this, they perhaps expressed their expertise. Another explanation may be the fact that forests are more clearly a part of the everyday life of those who are working in agriculture or forestry than those who are living in towns and working in offices (see also Gunter 1987, and Järvikoski & Kemppainen 1991). It is noticeable that although agriculture or forestry

people have ranked young stands or clear-cuts higher in the question of the wilderness character of the verbally described forest stands compared with some other groups of respondents, the first mentioned persons have given a little lower scores to the young stands in the slide show. One should, however, remember that a great deal of forestry people who took part in the slide show, were young forestry students who have probably visited in many nature conservation areas as a part of their education or otherwise. Besides, many of the young students may be wilderness enthusiasts, or even wilderness purists.

One should, however, ask if a purist is the most critical person towards wilderness quality. The interrelationship between wilderness visitors wilderness attitudes expressed by purism scores and wilderness quality have been studied in Canada by Shin and Jaakson (1997). They found rather weak significant correlations between the attitudes and wilderness quality evaluated by wilderness visitors or managers. High purism scores were correlated with high quality of wilderness areas and vice versa. The interdependency, however, varied depending on subgroup, such as males and females or different age classes and so on. Furthermore, the quality evaluated by wilderness visitors were not correlated with the quality evaluated by wilderness managers.

Furthermore, as Järviluoma (1996) points out, the effect of the demographic background variables on the scenic preferences have varied in different studies. The results of some studies may have been opposite. On the other hand, certain universal features in the preferences have been found. One interpretation might be that the similarities in the preferences are genetic in nature, and differences are due to the education or the other cultural process. This point of view would combine the approaches of "culturism" and "evolutionism" (Kallio 1992, Järviluoma 1996, see also Fig 1, p. 21). It may be true that the differences could be explained in most cases by analyzing the demographic background. However, the similarities that have been found, do not necessarily prove the effect of the genetic background on the preferences.

When we are talking about the study of the landscape preferences, one may ask if the results from using the *slides* are similar to the results that would have been achieved by showing the forests to the respondents while on the *stands*. Although the slides cannot show all the features in a landscape, the slides proved to depict reasonably well the variety of landscapes. As noted in the previous landscape studies, the correspondences between the slide and field evaluations have proved to be sufficient (e.g. Shafer & Richards 1974, Daniel & Boster 1976, Patey & Evans 1979, Benson & Ulrich 1981, Savolainen & Kellomäki 1981, Hultman 1983a). However, besides the different appearance in the landscapes shown by the slides and in nature, there are many other reasons why the results differ from each other. The respondents may be in different mental condition at the times of the evalua-

tions (see Fig 1, p. 21) or their attitudes towards the landscapes may have changed during the lag time (about one year in this study).

In it understandable that the estimation of the scenic features proved to be the most difficult in the middle of the ranking scale, as it has been noticed in this study. Despite the variation in the ecological characteristics, the stands ranked near the middle of the scale may have looked very similar. Furthermore, the ordinary landscape of a commercial forest does not awake any strong emotions. The landscape is neither very attractive, nor very forbidding. Thus, the evaluations of the same landscape may differ by one or two scores using the ranking scale from zero to ten. On the other hand, using a five-point scale in the evaluations, most of the differences may have vanished.

The ecological or visual characteristics that make it difficult to evaluate the scenery similarly in the field and shown on the slides have been found to differ from one visual quality to another. It is understandable, because different characteristics promote different experiences, and certain characteristics are perhaps more difficult to evaluate in the picture. As an example, the coverage of slash was the most important feature in increasing the difficulty to evaluate on slides forest's suitability for outdoor recreation. The physical hindrance caused by slash is perhaps noticed much more directly on the forest stand compared with the slide representing the stand. On the other hand, the number of stems, the feature that had an influence on the difficulty in the evaluation of the scenic beauty and the wilderness character, may be rather difficult to evaluate in the picture. These studies should, however, be done more intensively in the future in order to increase the understanding about the shortcomings in landscape studies like this.

The questions about the *constructions* that are allowed to built in wilderness areas are very important for wilderness management. As an example, summer cottages that have been built mainly on the shores of rivers and lake systems or the seashore, disturb the recreational use of these areas and impair wilderness experience. Furthermore, large nature areas, particularly in northern Finland, have been constructed or otherwise developed for tourism purposes (advanced accommodation systems, cottages, cafeterias, wind shelters, ready made ski tracks, fish plantations using rainbow trout an so on). These constructions and management activities are necessary in certain areas, particularly in promoting cross-country skiing, the most popular tourism activity during winter (Hemmi 1995). A manager should, however, keep in mind that it is essential for wilderness experience to abstain from the development like this in certain areas. These guidelines have been accepted in the management of our statutory wilderness areas (Erämaakomitean mietintö 1988, Erämaalaki 1991) as well as in some nature conservation areas and parks (e.g. Häyrinen 1984, Hallikainen 1990, 1991, Hemmi 1995). However, the need to think about retaining the wilderness character would be important in some other areas as well.

On the other hand, the results of this study suggest that people have perhaps got used to constructions like marked trails, rubbish collection and ready-made campsites in wilderness. Moreover, the cultural heritage can be clearly seen in the attitudes towards the constructions or the other things indicating the presence of humans: open huts for common use, remote wilderness cottages and wooden paths crossing mires or other paths as well as the old places of campfires are the best accepted signs of humans, the signs that have been in Finnish nature for centuries (see Pälsi 1944). The expectations, and generally known "spirit" or status of an area, obviously determine largely the accepted constructions and the other management activities in an area. As an example, Uusitalo (1993) found out that the users of the naturally managed forest area of Ylläs-Pallas in the northwest part of Lapland, appreciated marked paths and ready-made ski tracks in the area. The area has been regarded as wilderness by many of the respondents in this study. Furthermore, Sievänen (1995) noticed that from 64 to 84 percent of Finnish trail hikers thought that the quality of the hiking trail services and constructions is adequate, and only five percent thought that there are too many constructions and other services along the trails.

Although the ready-made constructions like campsites, fire places and paths are obviously rather well accepted management activities in wilderness areas, they may impede the experience of freedom. Moreover, the effect of payments (e.g. cabins for rent) on the experience of freedom have to be thought about very carefully. Many researchers (e.g. Hammit 1982, Hammit & Madden 1989, Scherl 1989, Merigliano 1990a, 1990b) have noticed that freedom to do desired things is an important indicator of wilderness experience. Although freedom is perhaps not as important a feature of wilderness experience among Finnish people as it is among American people, the lack of freedom in a strictly regulated and highly constructed area may reduce the popularity of the above mentioned constructions. However, the importance of freedom to Finnish wilderness visitors should be studied more intensively than it has been done in this work.

Wilderness experience has to be different from everyday life experiences and the pressures that life puts on a person (Manfredo et al. 1983, Gunter 1987, Kaplan & Kaplan 1989, and Merigliano 1990b). Moreover, the experience of primitiveness is an important feature of wilderness experience, and life in the wilderness has to be ascetic (Virden & Knopf 1989, Lucas 1990a). These ideas have to be taken into account when the building of advanced constructions, like wilderness cafeterias or other constructions making wilderness life more easy and comfortable, are planned in wilderness. The results of the two questionnaires in this work suggest that if coffee and snacks are sold in the wilderness, the quality of a cafeteria may have an effect on the experience. As an example, if these services are sold in a traditional Saami type hut, the experience may differ remarkably from everyday life, thus being a rather positive experience, even in a wilderness-like con-

text. However, there should be some areas that ensure an opportunity for very primitive life in nature, following the lines laid down by the Wilderness Acts of the United States of America (ref. Stankey 1990) and Finland (Erämaalaki 1991). As mentioned in Chapter Three, primitiveness may be important to the experience of freedom (e.g. Fromm 1977, Hart 1984).

In the United States of America, defining wilderness quality has been largely concentrated on the number and quality of the appropriate constructions and the number and quality of encounters as well as the other signs of human impact caused by the recreational use in the areas (e.g. Lucas 1990a, Merigliano 1990a, Donnelly et al. 1992, Vaske et al. 1992, Whittaker 1992, Watson et al. 1993). As Merigliano (1990a) points out, the scarcity and fewness of constructions is one of the main indicators of wilderness. Although recreational users usually accept constructions like ready-made campsites in American wilderness areas, the constructions should be simple (Lucas 1990a). Furthermore, Stankey and Schreyer (1987) have noticed that recreational users want to preserve "a status quo" in wilderness areas. This means that especially the changes in the "urbanity level" of wilderness may deteriorate a visitor's wilderness experience very much, similar to the man-made changes in a forest scenery.

The results in this study point out that the concept of "*social wilderness*" is much wider and partly different from the concept of statutory wilderness defined by the Finnish Wilderness Act (Erämaalaki 1991). Besides statutory wilderness areas, areas of remarkable wilderness character have been found nearly in all parts of our country. Especially the (administrative) districts in which the area of old forests is highest, have been sources of wilderness experience. However, these administrative districts have not been noted as the most preferred counties of residence (see Hämäläinen 1974). Thus, in most cases a wilderness area is situated so far from a visitor's home that according to the definition expressed by Hunt (1990), a wilderness visitor is a tourist.

All of our statutory wilderness areas have been mentioned as wilderness areas by some respondents. The low frequencies obviously indicate that the number of visitors in the areas is rather low. Until recent days, the media has not told very much about the features of the areas. Thus, it is evident that these areas are just been discovered by many of the recreation users. On the other hand, the areas are rather demanding environments for survival because of nearly complete lack of ready-made paths and campsites as well as few possibilities for indoor accommodation. Besides the statutory wilderness areas, other types of our nature conservation areas are an important part of Finnish wilderness as well, over half of the visits have been directed to these areas. In the future, the areas have to retain rather primitive for the wilderness visitors.

Besides the nature conservation areas, parks or statutory wildernesses, certain areas in our commercial forests are regarded as wilderness. Most of

the areas are remote areas, characterized by matured forests, open mires and sparse roads. Moreover, the areas like archipelagos that may be difficult to reach are important to wilderness experience. A journey to a distant island may be an adventure that demands struggle, and a person cannot control his or her environment but have to reconcile him- or herself to the circumstances, the things that may be important to wilderness experience (see Hart 1984, Kaplan & Kaplan 1989, and Williams et al. 1989).

Finally, it is a challenge to the managers of the commercial forests to try to manage the forest in a way to preserve at least some of the wilderness features besides nature's beauty. The list of the areas in this work would give some information about the most valuable areas in our commercial forests as well. However, the features, such as old forest stands including dead trees and open mires with little forest islands, can be found in every part of the country. These features should be taken into consideration in the planning of forestry activities to ensure at least some people's wilderness experience near their homes. Although a single forest stand, or a single dead tree in a forest, is not a wilderness, they may exemplify wilderness (see Chapter Two). Like Frisbie (1969) mentions, a person can strengthen his or her wilderness experience in managed nature by paying attention to the certain wilderness features that may be found in the area.

7.2.2 Discussion about outdoor recreation in Finnish nature and wilderness

The questions of wilderness recreation in Questionnaire 1 have been expanded to reveal some features in the outdoor recreation of our nature in Questionnaire 2. Although the concept of nature has been defined to the respondents as an environment where the natural characteristics dominate, certain difficulties in the interpretation of the concept may remain. This is because a person's relationship to nature defines his or her mental images about nature and thus the definition of nature (Silvennoinen 1992). In the following, the results of nature and wilderness recreation will be discussed and compared with each other as well as with some former studies in the contexts of nature or wilderness recreation and physical exercise in nature. The concept of physical exercise in nature has been defined as "physically active leisure activities in order to satisfy the need to move or some other needs" (Vuolle 1992, p. 19, translated into English, see also Telama 1992). Thus, the concept includes the utilitarian exercise like berry picking or hunting and fishing as well (Vuolle 1990). The concept of *aito luonnonympäristö* (original nature environment), used by Vuolle (1990, 1992), resembles the concept of wilderness, and the concept of *muokattu luonnonympäristö* (slightly changed nature environment) includes non-wilderness nature areas.

It has been said that nature itself, and physical exercise in nature, are self-evident things to Finnish people (e.g. Silvennoinen 1992). The results of this work as well as the results of some previous studies (e.g. Vuolle 1990, 1992, Sievänen 1995) support this statement. There are few Finnish people who never visit nature during their leisure time. However, the participation in outdoor activities as well as the frequency of the visits varies between the seasons. Summer has been noticed to be the best season for outdoor activities, in this study and by Niemi et al. (1991). However, according to the latter study, the differences in the participation in the outdoor activities of jogging, hunting or fishing did not vary very much between autumn, winter and spring. Nearly the same can be said about the daily time that has been consumed for the activities. In this study, nearly all of the respondents told that they visit in nature in all of the seasons. The proportion of those who visit nature daily, or nearly daily, is the smallest in winter and in spring. Low temperatures, darkness and heavy snowfalls in winter may have an effect on the winter frequency. The bad condition of the roads, paths and tracks, as well as rather low possibilities to utilitarian exercise may reduce the popularity of spring as an outdoor season. One has to remember that a rather big proportion of the respondents of Data Set 2 in this study live in northern or eastern Finland, in the areas of swift but vehement spring.

The frequencies of nature visits of different length that have been noticed in this study are rather similar to the results of Sievänen (1995), in her study of people's participation in trail activities in Finland although the specification of the frequencies by different activities makes the comparisons rather difficult. As an example, Sievänen (1995) noticed that about forty percent of the walkers or hikers made from 1 to 52 trips/years, one-fourth from 53 to 104 trips and slightly under forty percent 105 trips or more. However, about forty percent of walkers or hikers made their exercise along sidewalks in urban or otherwise developed environments. A Finnish outdoor recreation study (Sisäasiainministeriö 1980) suggests that the frequency of participation in walking during the season when the activity is available is as high as 4.6 times per week and participation in skiing is 1.7 times per week. Sievänen (1995) has noticed that the cross-country skiers made on average about twenty skiing trips of under twenty kilometers and six long-distance trips of twenty kilometers or longer during a year. Furthermore, about seventy percent of the hikers and eighty percent of the skiers have not made trips of several days (Sievänen 1995). These results are rather similar to the results in this study.

The results suggested that weekends are obviously a more suitable time for nature visits than holidays; a bigger proportion of the respondents visit, and want to visit, nature during weekends than during their holidays. On the other hand, among those respondents who had a holiday, there are only few persons who expressed that they have spent zero percent of their last holi-

day in nature. Thus, many of them who told that they have not made any nature visits during their holiday may be persons who have not had any holiday. Despite this possible explanation, the proportion of those who want to visit nature during their holiday remains lower than the corresponding proportion of weekends. However, the respondents of Data Set 2 have spent, on average, a week of their last vacation in nature, and some of the respondents who have had a long vacation, have spent most of the vacation in nature. They may have spent the time in their holiday cottages or many of them may have made long cycling tours or wilderness trips. This interpretation may be evident because a big proportion of these persons were rather young, highly educated men, mainly students.

It may seem a little confusing that there are some respondents who have told that they visit nature although they have not expressed their desire to visit nature, the difference being the biggest in the weekend visits. Although the concept of leisure has its conceptual confusions, freedom to do the things has been mentioned as a typical feature of leisure activities (e.g. Sylvester 1990). Thus, one should ask if a nature visit belongs to the category of leisure activities in a situation that a person feels that he or she has been pressured or even forced to visit nature. However, sometimes this may be the situation. As an example, a man may persuade his wife to come with him to a forest although the wife has planned to do something else (see Howard & Madrigal 1990). Another explanation may be an effect of perceived boredom in leisure activities on the desire to participate in the activity. As it has been pointed out in the study of the so-called Leisure Boredom Scale, the feelings during a person's leisure time may be the following: "During my leisure time, I feel I'm just spinning my wheels" or "In my leisure time, I usually don't like what I'm doing, but I don't know what else to do" (Iso-Ahola & Weissinger 1990, p. 6).

If a person has too much leisure time, the feeling of boredom may be worse compared with the situation of having an appropriate amount of leisure time (Iso-Ahola & Weissinger 1990). Thus, a person's willingness to participate in leisure activities may be remarkably low although he or she has very much time for that. This thing may have an effect on a blue-collar's, student's or home-maker's negative attitude towards the use of their possible unemployment or pension time for nature activities. Furthermore, some unemployed persons or pensioners may feel that they have too much leisure time and get bored. This may reduce their desire to visit nature although they actually have visited there. Furthermore, a person's possible fear of growing old and becoming "unnecessary" for society, or the fear of being unemployed may have an effect on his or her desire to visit nature during the pension or unemployment time, despite of the fact that during the pension or unemployed time, a person has time to take an interest (see Antikainen 1989, Hänninen & Polso 1991).

Staying overnight in nature, or particularly in wilderness, may be a fascinating Experience although the results of this study suggest that almost under ten percent of the nature visitors and about one- third of the wilderness visitors do not stay overnight in nature or wilderness. Their own cabin on the shore of a lake or sea is obviously the most preferred place to stay overnight in nature, being an important part of the Finnish tradition and life style (Vuolle 1992). Moreover, an open hut for common use or, nowadays, a wilderness hut for rent has often been accepted as a place in which to stay overnight in wild lands or wilderness. A night in nature or in wilderness is perhaps an important and highly needed counterbalance to urban accommodation. Thus, it is not surprising that the farmers or the other rural dwellers do not need to escape to spend their night in wilderness as much as the young, highly stressed urban workers.

Outdoor accommodation is a traditional and rather popular way to stay the night in nature among Finnish nature and wilderness visitors. An open fire has been closely related to outdoor accommodation (e.g. Pälsi 1944, Kemppinen 1966, Lucas 1990a). Besides the traditions, the freedom to choose a camping place in many of the nature and wilderness areas as well as an opportunity for the privacy of a person's own camp site, may inspire a person to stay his or her night outside. The components of privacy in wilderness are: 1) silence and natural environment, 2) perceived freedom to choose, 3) perceived social freedom, 4) togetherness (friendship) and 5) individuality (Hammitt & Madden 1989). Moreover, a person's skill to stay the night in wild nature has always been regarded as a characteristic of a "real man". Thus, it is not surprising that outdoor accommodation in wilderness is much more popular among the men compared with the women. Poor health, and perhaps the appreciation of some convenience may be a reason why the older people prefer to stay their night at home. Finally, Sievänen (1995) did not make any difference between those outdoor trail users who have stayed overnight in a cabin for common use and those who have chosen outdoor accommodation. However, the importance of these rather "wild" ways of accommodation among the trail users has been noticed in the study.

Motives and *activities* of nature and wilderness visitors have been noticed to vary between the groups of the respondents (e.g. Burch 1964), and the motive structures inside the activity groups differ remarkably from each other. Furthermore, although many similarities have been found in characterizing the motive and activity types among the *nature visitors* of Data Set 2 and the *wilderness visitors* of Data Set 1, certain differences between the data sets have been found among the respondents belonging to the same type. An explanation may be the effect of the contexts on the results; it is the difference between the concepts of "nature" and "wilderness". Furthermore, the particular differences in the structured motive and activity alternatives in the questions obviously have had an effect on the differences. However, first of all, the biases in the sample of Data Set 2 may have caused many of

the differences. Thus, the motive and activity typology of the wilderness visitors may be more reliable than the typology of the nature visitors although the last mentioned typology was interesting and gave perhaps some suggestive information for further studies. However, the main interest should be focused on the similarities in the interpretation of the results. Furthermore, one should remember that the structured questionnaires have certain shortcomings in order to find out the person's activities and, particularly, motives (see Telama 1986). Thus, at their best, these results should promote further studies using the other methods as well.

In the following, the *activities* and *motives* as well as the main features of the motive and activity typologies of nature and wilderness users will be discussed and compared with the results of some previous studies. One thing to make the comparisons difficult is the forms of the questions: in this work the question has been set to find out the primary motives and activities, but in many of the previous studies (e.g. Vuolle 1990, Kangas & Niemeläinen 1995, Kajala 1996) there has been a question of a respondent's participation in an activity (participate or not) or the importance of a motive (important or not) in spite of the ranking of the importance (e.g. Telama 1986).

As it has been noticed in some previous studies (e.g. Sisäasiainministeriö 1980, Vuolle 1990, 1992, Sievänen & Knopp 1992, Sievänen 1995), jogging, walking and track skiing are the important outdoor *activities* among the Finnish people, and our nature has a dominating role as an exercise environment. The emphasized role of these activities among the southern, and perhaps rather urban, dwellers may be due to the restricted possibilities to more traditional and wilderness-like activities in the southern part of the country compared with the other parts of Finland. It has to be noticed in the interpretation of the results of this study that skiing has been bundled together with the summer exercise activities. Thus, one should not think that the southern people are more active skiers than the northern ones. In some other Finnish studies, participation in the winter activities like skiing has been noticed to be the most active among the dwellers of Lapland (Kangas & Niemeläinen 1995, Sievänen 1995, Kajala 1996).

It is understandable, as the results of this study suggest, that the motive of physical training has been emphasized by the joggers, walkers and skiers. However, although many of the skiers or walkers are obviously exercise-oriented (the concept by Vuolle 1992) persons, the motives like peace and silence as well as the scenic experiences (the motives typical for recreation-oriented nature exercise) are important to track skiers or trail walkers as well. The result is consistent with the results in Telama's (1986) study. Besides hiking and trekking, utilitarian exercise (such as, hunting, fishing, picking berries and mushrooms) has had a role in the recreational pattern of joggers, walkers and skiers. It is delightful for national health care that training is obviously an important motive for many of the nature visitors, although

many persons find their exercise by utilitarian exercises (see also Telama 1992, Vuolle 1992).

The close connection of the Finnish people to our nature has become evident, particularly in the importance of the traditional utilitarian exercises, such as hunting, fishing and picking berries or edible mushrooms (e.g. Sisäasiainministeriö 1980, Vuolle 1990, 1992, Sievänen & Knopp 1992, Salo 1984, 1985). The utilitarian exercises have been practiced mostly in the "original nature environment", corresponding to the wild land or wilderness environments (Vuolle 1990, 1992). On the other hand, hunting and fishing are popular activities in the United States as well (Kelly 1977, Sievänen & Knopp 1992).

The results in this study suggest that a hunter or a fisherman is clearly more often male than a female, living mainly in the northern part of the country. This is not surprising: man's traditional role in our country has been for centuries to hike in the wild nature for game and fish, at the same time the females have been doing their work at home. The tradition has lived longest in the northern part of the country as an important part of everyday life (e.g. Voionmaa 1918, 1947, Itkonen 1948/1984). The difference between the genders has been noticed in some former studies as well (e.g. Vuolle 1990, Liikkanen et al. 1993, Kajala 1996). Furthermore, Kajala (1996) found that the dwellers of Lapland are keener hunters than those people living in the other parts of northern Finland, something that has not been noticed in this study. Furthermore, according to Kajala (1996) thirty percent of the dwellers of Lapland have participated in hunting, and about seventy percent have practiced fishing during the last year. The proportion of fishermen in the whole country has been slightly under fifty percent, and that of hunters slightly under ten percent according to Liikkanen et al. (1993). Vuolle (1990) has noticed that slightly over fifty percent have practiced hunting or fishing in summer and slightly under thirty percent in winter. The results of this study suggest that these activities are the main activities about for one-fifth of the respondents.

Otherwise Vuolle (1990) has noticed, females in this study have been keener in picking berries and mushrooms, a feature that has been noticed by Salo (1985) in his study revealing the participation of the dwellers of Joensuu and Seinäjoki in picking these goods, as well as by Kajala (1996) in her study of Lapland's nature for local recreation. However, the differences between men and women in the two latter mentioned studies have been smaller compared with this study. The ranking of the activities in this study may have had an effect on the differences in the results. This means that although many men may sometimes pick berries or mushrooms, this activity may not be their primary activity in nature. Furthermore, the results obtained by Salo (1985) and Kajala (1996) suggest that middle-aged persons have participated more often in picking berries or mushrooms. The results of this study, however, suggest that this activity is the primary activity for the pensioners.

Again, the form of the question may cause the difference. Sixty years old and older persons belong to the generation who have widely become accustomed to go into forests for berries or mushrooms (Vuolle 1992). In the old days, the shelves of the stores were not packed full with all kinds of juices and jams! However, it is alarming that perhaps a much bigger proportion of wild berries and mushrooms will be left in the forests in the future when the young people of today dominate the society.

Kajala (1996) has noticed that the same, or even bigger, proportion of the dwellers of Lapland have participated in picking berries or mushrooms compared with the proportion in the other parts of the country. The proportion in Lapland was 88 percent (Kajala 1996), and the proportion among Finnish people has been 67 percent by Liikkanen et al. (1993), 87 percent by Kangas and Niemeläinen (1995) and 81 percent by Vuolle (1990). The results of Data Set 1 in this study give support to these results. Although collecting these goods in nature has been the primary activity for only about forty percent of the respondents, the proportion is rather similar in all parts of the country. The results of Data Set 2 suggest that the proportion is remarkable lower among the dwellers of Lapland compared with the other parts of the country. Considerably younger respondents in Lapland compared with the other districts in Data Set 2 probably cause the difference.

In the past, the motives of hunting, fishing as well as collecting berries and mushrooms were obviously rather different from the present motives, a man was forced to roam in the forest to get something to eat. However, the ancient pattern of use can still be noticed in the outdoor activities of the Finnish nature and the wilderness recreation users. The motivation structures have, however, changed from those ancient times, and the traditional activities have partly been replaced by some new ones. Besides game, fish and berries, peace and silence, the beauty of nature and escape from everydayness is important to most of the present hunters and berry pickers (see Olson 1969). However, facing the challenges has been, and still is, a rather important motive for many of the hunters, and perhaps for some berry pickers as well (Telama 1992). This motive has been mentioned by some of the hunters or fishermen as well as hikers and nature observers in this study by the expression "to test myself". The wilderness environment offers the best environment for facing the challenges and test oneself (see also Telama 1992).

The concept of prey has obviously been extended and changed during the times: photographs are the prey for a nature photographer, and to observe a rare animal may be equivalent to the catch of the animal. Thus, it is not surprising that a nature photographer or a nature-observing enthusiast is more often a rather young person who lives in an urban environment than an old person living in the countryside. On the other hand, many nature and wilderness visitors still go into forest for the traditional, "real", prey like game, fish, mushrooms and berries. Thus, it is not surprising that a bigger proportion of those who have grown up, and are perhaps still living, in the

countryside, name the possibility to get prey as their main motive for their nature visits compared with the urban dwellers.

Otherwise the utilitarian exercise activities, hiking and trekking are the culturally new activities taking place in Finnish nature. However, these activities are obviously rather popular among the Finnish people, but not as popular as the traditional activities (Sisäasiainministeriö 1980, Vuolle 1990, 1992, Sievänen 1995). As an example, according to Vuolle (1990) about fifteen percent of Finnish people have participated in hiking and trekking. About the same proportion has mentioned hiking and trekking as their primary activity in this study. Physical exercise, physical and mental self-testing have been combined with the scenic experiences and the experience of peace and silence as well as the social dimensions during a hiking trip. This spectrum of motives has been largely reported in Lyytinen's (1992) study of the characteristics of some Finnish hikers and their feelings during a hiking trip, as well as in the study carried out by Saarinen (1995a) among the hikers of Urho Kekkonen National Park.

Particularly the results of Data Set 1 in this study suggest that a typical hiker is a middle-aged, rather highly educated person who live in rather, but not very, urban environment. According to the results of Data Set 2, the hiker is more often female than male, but the more reliable results of Data Set 1 do not support to this result. In the studies of Lyytinen (1992) and Saarinen (1995a), a typical hiker has been said to be a middle-aged person, and according to Lyytinen (1992), he or she has obviously grown up in the countryside and lives in a suburb. Furthermore, Lyytinen (ibid.) claims that a typical hiker is male, and in the data of Saarinen (1995a), the proportion of males among the hikers was 58 percent. Moreover, Vuolle (1990) has found out that the proportion of males who have participated in hiking trips was almost two times the corresponding proportion of females. This feature has not been noticed in this study, but males and females have been equally represented among the hikers, or it is possible that females even dominate the activity groups. The ranking of the activities in this study may have had an effect on the results: it is possible that a bigger proportion of men have made hiking trips compared with females, but the men's main activity (most liked activity) may be, as an example, hunting if they had an opportunity to hunt, perhaps during a short period in autumn. On the other hand, women have been considered as the real pioneers among hikers (see Kemppinen 1966).

Photographing and painting are obviously closely related to participation in hiking and trekking. However, only a minority of the nature (or wilderness) visitors have chosen these as their primary activities. Nature photography is perhaps a compensatory activity for hunting, done mainly by rather highly educated persons. Thus, it is possible that photography will increase its popularity in the future, particularly if the possibilities for hunting are decreasing and if the educational level is increasing.

Sievänen (1995) has noticed that exercise, relaxing and contact with nature are the most important *motives* for Finnish trail users. Thus, the result is rather similar to the motives of the nature visitors in this study if the motive of relaxing has been replaced by the motive of peace and silence, and the motive of being in contact with nature by that of beautiful scenery. However, the replacement has to be done with cautions. Togetherness has been noticed as an important motive in both of the studies. Furthermore, a natural environment has been mentioned as the most important reason to choose a long-distant trail in the study of Sievänen (1995). The results are rather consistent with those obtained by Telama (1986) in his study of the motives behind the physical exercise of the Finnish people. Moreover, fresh air and exercise have been emphasized by the outdoor recreation users of Aulanko Recreation Area in a Sievänen's (1992) study. Landscape experiences and the experience of peace and silence were important motives but remained in the shadow of the first mentioned motives.

Freedom has often been mentioned as a motive for wilderness recreation and is closely connected with the wilderness privacy (e.g. Hammitt & Madden 1989, Hammitt 1994). However, the motive has not directly been emphasized in the empirical Finnish studies (Telama 1986, Sievänen 1992, 1995). Freedom is perhaps closely related to the "escape from everyday pressures to nature", to a simple life without any constraints (see Fromm 1977, Kaplan & Kaplan 1989, Telama 1992). Although the escape may include the opportunity for solitude and has been mentioned by one tenth of the women of a study (Telama 1992), the latter mentioned motive has not been mentioned by many of the respondents in this study. The importance and dimensions of solitude will be discussed more closely later in this study.

Freedom and escape from everydayness have been mentioned as primary motives by fifteen to thirty percent of all the activity groups except those who mainly pick berries or mushrooms in our nature. The result is understandable remembering that a great deal of the berry or mushroom pickers are rather old persons who more seldom than the younger ones want to feel freedom or escape everydayness in nature. Moreover, good areas for berry and mushroom picking are probably the well-known areas near a person's home. Thus, unlike the scenic experiences or the experience of peace and silence, the experience of freedom is not a motive to bring a person to his or her picking place.

As it has been mentioned earlier, nature is an important environment for scenic experiences and experiences created by the perceptions of animals or plants (see also Telama 1992). The differences in these experiences between the groups of people have been sparsely studied before. However, in a study of the motives in nature exercise made by Telama (1986), scenic experiences, and nature itself, has been noticed to be more important to females than to males. This difference has not been found in this study. The results in this study suggesting that the nature visitors who live in towns and particu-

larly in the southern part of the country, are more affected by beautiful scenery compared with the reference groups, is understandable. If a person lives in an artificial, perhaps not very beautiful, urban environment, nature's beauty may be an important contrast to this environment giving a new and refreshing stimulus (Kallio 1992). The results of Data Set 2 suggest that seeing beautiful scenery has been more important to the older respondents, but the results of Data Set 1 gave the result that was obviously the opposite of this. Although the difference was not statistically significant, and thus may be due to chance, it is obvious that the difference has been mostly affected by the biases in the sample of Data Set 2 and by the bundle of the scenic experiences with the experience of seeing animals or staying overnight in wilderness in the questionnaire of Data Set 1. A bigger proportion of the northern respondents in Data Set 2 were young people compared with the southern or eastern respondents. The bundle most likely prevented the certain differences from coming forward.

Peace and silence have been bundled into a single motive in both of the questionnaires in this work. The concepts of peace and silence, however, differ from each other to a certain extent and should be divided into different dimensions. Peace is a wider concept than silence including a social dimension besides the auditive one (Saastamoinen 1996). The social dimension includes the sub-dimensions like "being voluntarily separated from the other people and noise caused by them" as well as "an escape from everyday pressures". Furthermore, peace includes a spatial dimension as well, to have enough space around oneself. (Saastamoinen 1996, p. 23). The first mentioned sub-dimension of peace is equivalent to the motives of privacy or solitude, the important motives of the wilderness recreation (see e.g. Hammitt 1982, Hammitt & Madden 1989, Roggenbuck 1990). Moreover, Rossman and Ulehla (1977) have mentioned that wilderness is an excellent environment to experience peace and silence as well as to obtain a different perspective on a person's own life. Peace and silence have been noticed to be important motives in the other studies revealing the wilderness motives of Finnish wilderness hikers as well (Saastamoinen 1972, Saarinen 1995a).

There are certainly a group of people in Finland who want to be completely alone in nature or wilderness (Telama 1992, Saarinen 1995a). Everyday pressures may certainly "push" a person to a solitary nature, and particularly to a solitary wilderness visit. As Telama (1992) believes, the motivation of "escape from everyday pressures" is closely related to the wilderness environment. However, solitude does not necessarily mean that a person has to be completely alone. As Hammitt (1982) have mentioned, the dimensions of solitude are: the experience of a remote nature environment, the experience of freedom, the experience of being together with friends in a little group and the experience of own personal identity ("being myself") as free from society's pressures. Thus, the motive of togetherness is not necessarily an opposite of solitude, but to be "alone in a group" (Hammitt

1982, Telama 1992, p. 67). Furthermore, the results in this study suggesting that togetherness is an important motive to nature and wilderness visitors is consistent with some Finnish studies of "urban nature" (e.g. Sievänen 1992) as well as in wilderness (e.g. Saastamoinen 1972, Saarinen 1995a), although togetherness may be the most important motive to rather few wilderness visitors. On the other hand, rather few wilderness visitors want to be completely alone in wilderness. As an example, Uusitalo (1993) noticed that only four percent of the visitors of Ylläs-Pallas Naturally Managed Forest Area in the western part of Lapland hiked alone.

As the results in this study suggest, the motives of Finnish "nature" and "wilderness" visitors are rather similar to each other, although some differences are noticeable in the emphasis of the motives. Perhaps the motives like fresh air or physical exercise have been emphasized by so-called "nature recreationists" (see also Sievänen 1992), whereas the motives like peace and silence, facing challenges or some special experiences (impressive landscape, stay overnight in nature) may be more important to wilderness visitors. Furthermore, despite some conceptual differences, the motives of the Finnish wilderness hikers are rather similar to those in the United States (see Hallikainen 1994). The most often mentioned motives among the American wilderness visitors are the experience of a natural environment, the experiences of solitude, peace, silence and freedom, the experience of togetherness with some intimate people as well as the opportunity for the challenges (e.g. Manfredo et al. 1983, Hammitt, 1982, 1994, Hart 1984, Stankey & Schreyer 1987, Hammitt & Madden 1989, Merigliano 1990b).

Kretchman and Eagles (1990) have studied the motives and the interests of nature tourists. According to their results, a nature tourist appreciates the wilderness environment, but also the countryside or other "semi-primitive" environments as well. Furthermore, he or she likes to face some physical challenges and meet other people thinking rather similar to him or her. A nature tourist wants to learn to know the nature and develop his or her skills for survival in the nature. Otherwise, an "ordinary" tourist wants more than a nature tourist to escape the pressures set by the society, live through exciting things and visit the places where his or her friends have not visited and tell about the visit to other people. Furthermore an "ordinary" tourist wants to share his or her visit with his or her family and feel safety during the visit. Moreover, amusement is more important to an "ordinary" tourist compared with a nature tourist. Thus, the motive structure of a nature tourist resembles the canoeists referred to as "visitors" or "collectors" by Schreyer et al. (1984). The motives of the Finnish wilderness visitors include the features of the motives of nature tourists and "ordinary" tourists as well. The need to experience the nature itself by the Finnish wilderness visitors points at a nature tourist, but the need to experience togetherness is perhaps more closely related to an "ordinary" tourist. The emphasized need to experience peace and

silence by the Finnish wilderness visitors is perhaps not a common need for a nature tourist.

Wilderness areas are still associated by the Finnish people as recreation environments. A person's wilderness images and expectations obviously have an effect on the "drawing of the wilderness boundary". Although the wilderness concept and the mental images of wilderness proved to be rather consistent among the respondents, certain variations in the images have been found. Thus it is not easy to say who has "really" visited wilderness and who has not (see also Schreyer et al. 1984, Stankey & Schreyer 1987). On the other hand, from the point of view of the social sciences, the most important thing is that the environment meets the wilderness criteria and the expectation formed by the mental images of a person. Nobody has a right to look down upon a person's wilderness experience. Furthermore, if a person has once visited wilderness, it is obvious that he or she visits the areas repeatedly. Roggenbuck and Lucas (1987) have noticed in the United States that from sixty to ninety percent of the visitors of certain wilderness have been in wilderness before.

More demanding criteria for the wilderness environment have been hardly the reason why the smaller proportion of the old, lower educated respondents or the farmers have experienced wilderness compared with the reference groups. A possible explanation may be that the mental images of older people have been changed during the decades (Schreyer & Driver 1990). The most reliable explanation, however, is that the above mentioned respondents have not been as interested in wilderness as their recreation environment compared with the other respondents. Nature, even the "wild" nature, has been an everyday environment to many older, rural persons, related closely to their sources of livelihood (Järvikoski & Kemppainen 1991). Perhaps these people have had no reason to name the environment as wilderness. Moreover, it has sometimes been claimed (e.g. Vuolle 1992) that young people have become estranged from nature. The results in this study do not support this idea. At least young adults have been noticed to be pro wilderness areas, and they have widely experienced wilderness.

The cultural heritage as well as a person's possibilities to visit wilderness have probably had an effect on the fact that men and the dwellers of northern Finland have experienced wilderness more often than female or those who live in the other parts of the country. Furthermore, those respondents who are most strongly against or for wilderness preservation, have expressed more often than the "moderate" persons that they have visited wilderness. Doing this, they perhaps want to express that they have an informed opinion about the preservation. On the other hand, their wilderness experiences may have had an effect on their opinion about wilderness preservation.

The characteristics of wilderness visitors are rather similar in the United States and Finland. Some of the American studies (e.g. Hart 1984,

Roggenbuck & Lucas 1987, Lucas 1990b) reveal that the most typical wilderness visitor is a rather young and highly educated male living in a town or a city. Furthermore, his level of income is rather high and he is a professional, or is working in the technical occupations. Priests, salespeople and home-makers have not been represented very well among the wilderness visitors. The participation of farmers in wilderness recreation has varied a lot between the districts in the United States.

The results in this study have revealed that the wilderness visitors are not only the long-distance hikers, the persons who spent at least many days in wilderness at a time. Thus, it is important to retain some small wilderness areas to ensure the need of those who pay short visits to wilderness areas. On the other hand, the results suggest that large wilderness areas like Urho Kekkonen National Park, are important to the short-time visitors as well (see also Saarinen 1995a).

The length of a typical wilderness visit in Finland is rather consistent with the visits in the United States. Roggenbuck and Lucas (1987) have noticed that the visitors of many of the wilderness areas in the United States usually stay from two to three days and nights in the area. In some areas, about half of the visits have been day visits. Furthermore, Lucas (1990b) has mentioned that most of the small or middle-sized wilderness areas are mostly the areas used for day visits, the proportion of which has been estimated to be from eighty to hundred percent of all visits. Only ten percent of the wilderness visitors have been estimated to make trips lasting a week or longer. Besides the time that has been spent during a visit, Lucas (1990b) has studied the distance of a visitor walks. The results have been the following: about sixty percent hikes 1–10 miles, a fourth 11–20 miles, from three to four percent 41–50 miles and the same proportion longer than 50 miles. In Finland, Uusitalo (1993) has noticed that a typical visitor of Ylläs-Pallas Naturally Managed Forest Area made a visit lasting four hours and hiked fifteen kilometers during the time.

The traditional cultural role of men as wilderness visitors can be noticed in the longer duration of wilderness visits compared with the women. Although some females are nowadays long-distance hikers, it may be a common pattern that a woman takes care of home and children at the time of a man's hiking, hunting or fishing trip. The duties at home may be a reason why the middle-aged respondents have been noticed to make longer visits compared with the younger persons. Furthermore, it is understandable that those who live in our cities, have made longer wilderness visits than most of the rural persons have done. The most attractive wilderness areas are located far from our biggest cities, and if a person leaves the city to travel for perhaps many days to reach wilderness, he or she naturally wants to spend at least some days in the destination. Furthermore, the young or middle-aged city-dwellers have found it important to experience peace and silence or the special Experiences like wilderness nights during their hiking trips in

wilderness. Rather long-lasting trips are perhaps needed if a person wants to live through these experiences deeply. Schreyer et al. (1984) have studied the variation in the length of wilderness visits of the different groups in the United States and found out that local people, old people and so-called veterans made the shortest trips. An explanation given by the researchers is that the people belonging to these groups hike more often than the others in their favorite areas. Furthermore, they noticed that the longest trips have been made by so-called collectors (people who want to experience some special Experiences).

Studying the motives of wilderness visitors is one approach to understanding visitors' wilderness experiences. The motives, activities and qualities of the wilderness environment are closely related to each other (Stankey & Schreyer 1987). This is a basis for the Recreation Opportunity Spectrum (ROS, Virden & Knopf 1989). The concept of ROS has proved as a useful tool for the wilderness management (Lucas 1990a). According to ROS, outdoor recreation in Finnish nature as a whole can be classified as a "semi-primitive" recreation although some persons may experience naturalness even in the ROS-classes named "roaded natural" or "rural". However, wilderness recreation can be classified into such classes as "primitive" or "semi-primitive, non-motorized" (Stankey et al. 1985, Lucas 1990a). For example, in Lapland snowmobile routes have been constructed through some statutory wilderness areas although the management activities like this may reduce the class into "semi-primitive, motorized". On the other hand, snowmobiles are necessary for local reindeer herders, and thus cannot be forbidden without destroying the traditional source of livelihood. Furthermore, the number of routes for motorized recreation users is very low. Thus the extra disturbance caused by the recreation users may be minor. However, the role of the motorized recreation users should be studied more using the ROS approach.

7.2.3 The assessment of the Finnish wilderness

Although the areas in their natural condition have always been appreciated to a certain degree (Driver et al. 1990, Hallikainen 1994), the appreciation of wilderness landscape and the wilderness areas as a recreational environment has probably increased during the last two centuries (Linkola 1985, Keisteri 1990, Uusitalo 1993). The attitudes in our country are rather similar to the attitudes in the United States (see Stankey & Schreyer 1987).

The results in this study suggest that the respondents have taken a positive attitude towards our wilderness areas, almost without exception. Furthermore, an astonishing unanimity about the reasons for wilderness preservation has been noticed. However, the opinions of the extent of the Finnish wilderness areas varied remarkably from one group of respondents to another. On the other hand, there were only few persons who thought that the

extent of the wilderness areas is too much. Thus, remembering that the wilderness concept among the respondents has been noticed as rather uniform, the results have given some evidence that the public opinion supports at least the preservation of our existing wilderness areas, and that areas with the wilderness character can be identified.

In this study, the three reasons for wilderness preservation that arose above the other reasons were: 1) the preservation of wild species, 2) the preservation of the wilderness areas for future generations and 3) to preserve the opportunity for wilderness recreation. In general, the reasons for the preservation of wilderness can be divided into the categories of anthropocentric and biocentric reasons (McCloskey 1990). Three of the most important reasons mentioned by the respondents in this study, as well as the other often mentioned reasons, fall into both of the categories.

Furthermore, under the concept of *value*, one can classify different values as utility values and existence values (Naskali 1992). At least rather often mentioned reasons for wilderness preservation, like an opportunity for utilitarian exercise, an opportunity for recreation, scenic beauty and preserving the areas for future generation's needs belong to the category of utility values. However, most of the reasons that have been mentioned by the respondents belong to the category of existence values. As an example, they have largely expressed their willingness to preserve the wild species living in wilderness areas despite the fact that the creatures were not of any use to them. Furthermore, the respondents wanted to preserve the originality of nature, the things that have always belonged to the nature. Wilderness is perhaps a symbol of stability for them. Moreover, the existence of a wilderness area has proved to be important to many of the non-users of the areas as well. On the other hand, some of these non-users may some day visit wilderness and they may want to preserve the opportunity to do that. Thus, a wilderness area may have an option value for them (see Naskali 1992).

The existence values are closely related to the intrinsic values, although certain differences between the concepts can be found (Price 1993). The intrinsic value has been defined by Price (1993, p. 49) as the following:

> Intrinsic value is the value placed on survival of an entity by the entity itself, quite separate from human knowledge or appreciation of the entity, or even human existence.

Thus, an intrinsic value represents the category of values that is furthest away from the category of utility values. Vilkka (1995) has studied the concept of intrinsic value and its relation to wilderness preservation and pointed out that wilderness, or the entities in wilderness, can be valued using the concept of the intrinsic value.

McCloskey (1990) has presented a rather complete list of the reasons for wilderness preservation. The list includes five classes of biocentric and four

classes of anthropocentric reasons. The most often mentioned reasons by the respondents in this work cover four of the biocentric and three of the anthropocentric classes. The reasons in McCloskey's (1990) list, such as to ensure the genetic evolution or administrative reasons, have not been mentioned by the Finnish respondents. However, if the reason of "to ensure the function of the biosphere" includes evolution, the reason has been mentioned by the Finnish respondents as well.

The reasons for wilderness preservation having been mentioned in this study, reveal that the Finnish respondents have regarded, and do appreciate, our wilderness areas as an important part of our national culture and lifestyle, similar to the American people (e.g. Thompson 1987). Furthermore, as Brown and Manfredo (1987) mention, the cultural values attached to wild nature are an important part of the social values, and the values can be noticed in a person's ethical attitudes and in his or her other attachments. However, according to the latter mentioned researchers, the permanence of the cultural values has not been largely studied.

Although rather small differences have been found between the groups of the respondents in their opinions about the reasons for wilderness preservation or conservation, most of the differences are consistent. On the other hand, the contradictory differences between city, village and countryside dwellers in the two data sets are difficult to interpret. The differences between the groups should be studied in more detail in future analysis by taking one reason at a time into the analysis.

It is understandable that the respondents who live near wilderness areas and have experienced the enchantment of wilderness, emphasize the areas as a recreation environment. Furthermore, in the thoughts of the older respondents, the needs of the future generations may set aside the expression of recreation as a reason for the conservation of wilderness. Those who have experienced wilderness may also notice the value of the areas for the future as well. Moreover, the emphasis of the rather highly educated urban wilderness enthusiasts can be clearly noticed: these enlightened persons naturally emphasize wilderness' role in the function of the biosphere and in the conservation of wild species. These reasons reflect the role of our mass media as well. On the other hand, the expression of "naturalness" being typical to the southern and urban dwellers, and to those who have not experienced wilderness, perhaps reflects rather low personal contact with wilderness.

Although there are only rather few respondents who have mentioned the conservation of forests as a reason for wilderness conservation, it is difficult to understand why a person like this is more often a countryside dweller than a city dweller. An explanation may be that the countryside dwellers have become differentiated. There are those who support the traditional activities, and the ways the activities have been done among the countryside dwellers. However, some of the countryside dweller may support considerate and more ecological ways to use nature (Järvikoski & Kemppainen 1991).

On the other hand, some countryside dwellers who own forest land, may have become irritated by the feeling that their ways to manage their forests have been strictly regulated by forest officers. Moreover, the forests have been noticed to be important to the forest owners living in the countryside as well as in the cities as a recreation environment, and the owners have been psychologically attached to their forests (Karppinen 1994, Hallikainen et al. 1997). In spite of this, the countryside dwellers obviously do not emphasize the uniqueness or the scarcity of the wilderness areas because their mental images of wilderness are obviously wider than the images of the city dwellers. Moreover, nature is perhaps a more dynamic entity to the countryside dwellers compared with the reference groups.

In general, a remarkable proportion of the respondents wish for more protected wilderness areas in our country. The addition should be directed to southern Finland, because the number and the extent of the areas is the smallest there. However, a big proportion of the respondents expressed their wish for more areas in northern Finland as well. Although about ninety percent of the Finnish nature conservation areas and statutory wilderness areas are located in Lapland and the areas have been highly concentrated to the northernmost part of the county (Maa- ja metsätalousministeriö 1996), there are many areas resembling wilderness without any conservation in northern Finland.

However, one should interpret with cautions a person's wish for more wilderness conservation. Perhaps the person has answered the question without thinking of the economic or social consequences of conservation. Particularly if the negative consequences are directed to the person him- or herself, his or her way of thinking may change. Järvikoski and Kemppainen (1991) have pointed out, that Finnish people do not usually underestimate environmental problems, but the researchers (ibid.) have noticed that the attitudes of the occupation groups that use nature for economical purposes become qualified when the economic realities and environmental problems have been set against each other.

Above all, the attitudes towards the conservation of the Finnish wilderness areas varies between the districts: there are many more of those among the northern respondents whose opinion is that particularly the conservation of the northern wilderness areas has been too comprehensive. This attitude often includes the elements like: a radical, highly educated, left-winger, south-living conservation activist who wants to conserve the wilderness areas without taking care of local people and their needs of the possibilities to live in the areas (as an example, see Hannula 1995). On the other hand, as the results in this study suggest, a great proportion of the respondents in Lapland are not against the present conservation, some may even wish for more conservation.

Although certain differences between the geographical district in the attitudes towards wilderness conservation have been found in this study, age

and socioeconomic status or occupation have been the strongest influence on a person's attitude towards conservation. A person's care of his or her sources of livelihood has been clearly noticed in farmers', or the other agriculture and forest workers', attitudes towards the conservation. Compared with the young respondents, a bigger proportion of the older respondents are farmers. Moreover, the attitude of the older respondents can perhaps be explained by the fact that these people have lived through the times when the Finnish people were forced to use nature resources very intensively to obtain the current standard of living.

Although the respondents have found wilderness areas in every part of the country, their favorite wilderness areas have been located mainly in the districts of North-Karelia, Kainuu, Koillismaa (the northwest part of northern Finland) and, particularly, in Lapland. Outside these districts, some areas like Kolovesi National Park in the district of Savo (in eastern Finland) and Seitseminen National Park in Häme (in southern Finland) have been mentioned rather often. The lake-island labyrinth of Kolovesi represents a typical nature of the lake district of Saimaa. The islands have been dominated by old coniferous forests. Besides the old, in some places gloomy, virgin forests and bogs dominating the original nature of Häme (in southern Finland), Seitseminen has included some areas of managed forest and drained bogs as a reminder to visitors of the days before the conservation of the area.

The status of a nature conservation area may increase the value of an area as a wilderness. This extra status may have an effect particularly on the popularity of Urho Kekkonen National Park as a Finnish wilderness. Moreover, the popularity of the park may be due to the extra status that the famous books written by Kemppinen (1959, 1961) and Huhtanen et al. (1964) have brought to the area. Moreover, not any of the Finnish wilderness areas have been described so widely in different publications (Häyrinen 1989). The history of the park may even be considered as a process from a nature area to an artifact. Thus, the area has a strong regional identity (see Chapter Two and Paasi 1986). Besides the extremely beautiful and many-sided landscape (Häyrinen 1989), the constructions as well as good paths and tracks may have increased the popularity of the park. Furthermore, Saastamoinen (1972) has found out that the visitors of Urho Kekkonen National Park appreciated the landscape of the park, good opportunities for skiing and hiking as well as the opportunity for peace and silence and the low number of other hikers in the area. Despite of the popularity of the area and increased number of visitors compared with the year 1972, peace and silence can still be found in the park (see Saarinen 1995a).

On the other hand, the extra status and development may drive away some wilderness enthusiasts from the area. This discussion is closely related to the concept and theory of a Tourist Area Cycle of Evolution (Butler 1980, ref. Kauppila 1994). According to the theory, the stages in the cycle

are the discovery of an area by enthusiasts, engagement, development, stabilizing, stagnation and, after that, retrogression or new growth. Not taking a stand in the discussion about possible shortcomings in the theory, one can clearly notice that the entirety of Saariselkä, being composed of a tourism center and the national park (Vuoristo 1984), has passed the first stage in the development. Slightly under half of the visitors of Urho Kekkonen National Park interviewed on-site by Saarinen (1995a), felt that they were in wilderness at the time of the interview, the proportion being 59 % on the shore of Luirojärvi (about middle of the park). This means that although the area is a wilderness to a considerable group of the recreation users of nature, there are certain groups of wilderness enthusiasts who obviously do not regard the area as wilderness and search for wilderness experiences somewhere else. Thus, although we include the areas like UKNP in the concept of wilderness, even with a certain glamour, we have to be aware of the need of even more pristine areas to ensure a person's wilderness experience. One should, however, ask if any pristine wilderness areas can be found in Finland in the future because of growing number of wilderness recreationists. Although we do not know the reliable trends revealing the development of the number of wilderness recreationists in Finland, it is evident that the number is increasing, the trend that have been noticed in the United States (Cole 1996).

Although the direct collection of money has not been a traditional way to support the conservation of nature in Finland, the results of a *contingent valuation question* suggest that at least the attitudes towards wilderness conservation are rather positive. However, one has to emphasize that the question measures only intentions, not the realized action. Furthermore, the sums of money are rather small compared with a study of Kriström (1989). The aim of the latter mentioned study was to evaluate eleven virgin forest areas located in Sweden, and as a result, the households expressed their willingness to support the conservation on average by 1 014 (mean) or 200 (median) Swedish crowns. One should notice that Kriström (1989) asked for support that would be given by a household, not a person. Moreover, Finnish people may have different norms for money collections like this. A Finnish norm for this can perhaps be expressed as: "A ten or two for a collection." Kriström (1989) disqualified some huge sums of money believing that it is a joke. In this study the biggest sum for the purpose, two thousand marks, was not disqualified because it has been believed that a person really can give that sum if he or she really appreciates the thing.

It is remarkable that only a minority of those who have expressed their willingness to give money, mentioned the area in which they wanted to support conservation. The problem that financial support has been directed to a larger area or the idea of conservation itself, has been known as the part-whole problem (Carson 1991) that makes it difficult to evaluate the value of a single area. However, in this study the main purpose has been to study the

attitudes towards wilderness in general, not the value of a single area, but knowing this problem, as well as many of the other problems involved in the contingent valuation method, the sums of money for the areas should be interpreted using caution.

It is understandable that most of the areas that have been mentioned as the objects of the support, have been located in northern Finland or in North-Karelia, because there are still many areas left in their natural condition without any conservation in these parts of the country. However, it is much more difficult to understand why many persons have expressed their willingness to support the conservation of some nature conservation areas by giving their money for the purpose. Perhaps these persons want to express their willingness to fend off the threat caused by air pollutants or some other nature-deteriorating activities that may threaten the survival of the areas. Another explanation is a person's willingness to extend the area. On the other hand, the discussion in mass media of the need of conservation of certain areas can be clearly seen in the results: the areas under discussion in the year 1990 were Kessi, Koli, Murhijärvi, Nuuksio, Talaskangas, Sopenmäki, the archipelago of Saimaa and Repovesi.

The differences between the groups of the respondents in their willingness to give the money, or put their signature on a petition for conservation, are rather consistent. Once again, a person's age and socioeconomic status or occupation have an effect on his or her willingness to give the money, the less willing groups being the older persons and the farmers or the other persons working in fields and forests. Furthermore, a bigger proportion of the dwellers of Lapland, particularly compared with those who are living in the southern Finland, is against more protection. Many of the dwellers of Lapland consider that it is difficult to increase the coverage of the protected areas in their district without loosing the opportunity to work, and even the prevailing coverage of the areas has had an effect on the unemployment of the district. Moreover, the method to support the protection directly by giving money, or signing a petition, may have an effect on the differences between the groups of people.

Kriström (1989) as well as Cocheba and Langford (1981) have noticed that a person's outdoor recreation activities add to his or her willingness to support conservation by giving money. The results in this study suggest that there are some differences between the activity or motive groups of the recreation users of wilderness. It is understandable that the hunters and fishermen, or those whose main hobby is to collect berries or mushrooms, are not as willing as those who hike in wilderness, perhaps collecting some immaterial experiences, to give their money for wilderness protection. The personal properties of the members belonging to the first mentioned activity groups explain the result very well. Moreover, a person's opportunities for hunting, fishing and collecting berries do not necessarily demand more wilderness protection.

When we are talking about the traveling resources that a person has directed to his or her wilderness visits, we must take into account a person's standard of living and the local travel culture as well as a person's concept of wilderness besides his or her appreciation of wilderness areas. As an example, the travel culture has been reflected in attitudes towards the distances. Moreover, a wilderness enthusiast may live near his or her favorite areas, and need not travel very far for the visits, but a city dweller living in southern Finland may need to make a long journey to reach wilderness, something that can be seen in the results. Older people, the pensioners, have not traveled as much as the younger ones for their wilderness visits during the last year. However, many of them may have traveled a lot for the wilderness visits when they were younger. On the other hand, as Driver and Basset (1977) point out, a wilderness visit may be only one reason for the journey. Thus, the variable describing the amount of traveled kilometers for wilderness visits is suspicious in describing a person's attitudes towards the wilderness areas. If we, however, assume that a "typical" wilderness visitor travels for wilderness using a means of public transportation, he or she has to pay annually from two hundred to five hundred Finnish marks for the visits.

8 Concluding remarks

The results of this study in comparison with the aforementioned studies suggest the following statements mainly for practical purposes.

1. Wilderness attitudes and landscape preferences can be studied quite reliably using quantitative methods. However, qualitative methods should be used in further studies in order to get a deeper understanding of the phenomenon.
2. Scenic beauty, wilderness character as well as recreation value of landscapes are ranked quite similarly in nature and by using slides. This is confirmed by the results obtained by some other researchers.
3. Finnish nature and wilderness areas are important to Finnish people whether they live in cities, towns or the countryside, in every part of the country. Furthermore, most of the people use these areas for their recreation. The most important reasons for wilderness preservation are future generations, endangered species and wilderness recreation. Furthermore, most of the respondents expressed their willingness to give some money for wilderness preservation.
4. Although some differences between different persons and different groups of people have been found in their attitudes towards wilderness, landscape preferences and their outdoor recreation habits, the differences between groups are rather small. These results can contribute to a more comprehensive understanding of wilderness management.
5. The wilderness character of a forest, similar to the scenic beauty of a forest and a forest's suitability for outdoor recreation, is a continuum. This means that some forestry activities are suitable even in areas where retaining the wilderness character is important. This means that matured commercial forests are rather wilderness-like environments. On the other hand, the forest and mire areas in their natural condition are the best environments for wilderness experiences.
6. Fell areas do not dominate the wilderness images of the Finnish people. On the other hand the Finnish fell areas have been widely regarded as wilderness areas. Old forests and untouched mires are an important addition to the wilderness character of the fell areas.
7. Lakes, ponds, streams and rivers as well as sea archipelagos are important for wilderness experience. The areas including these ecosystems should be managed carefully in order to retain their naturalness.
8. The different types of nature conservation areas, such as national parks, statutory wilderness areas, strict nature reserves and so on are the most important parts of the Finnish wilderness. About half of the wilderness visits were directed to these areas. However, our commercial forests have offered remarkable wilderness experiences to the Finnish people. Thus

the commercial forests should be managed to retain their wilderness character, scenic beauty and suitability for outdoor recreation.

9. A manager should avoid too many advanced and modern constructions or other management activities in the areas where retaining wilderness character is important. Some marked trails, constructed campsites with trash collection and open huts for common use are widely accepted in wilderness areas. Large areas should, however, remain completely without any constructions or management activities. When fish plantations are needed, a manager should use indigenous species instead of rainbow trout.
10. Roads for timber transportation or for other purposes disturb the wilderness experience very much. Using winter tracks instead of permanent roads would minimize the disturbance. Cutting off the roads of a certain area near the main road would perhaps enhance a person's wilderness experience by the person knowing that no one can reach the area by car.
11. About half of the respondents think that an area with the diameter of eight kilometers stands for wilderness if the area is covered with virgin forests and does not include any roads. The areas of this size, or even vaster areas, can be found mainly in the eastern and northern parts of the country. On the other hand, smaller areas may be important in the densely populated districts by exemplifying the "real" wilderness areas and enhancing the wilderness character of the district. Furthermore, a forest manager should retain some sub-areas in their natural condition when he or she is regenerating the forests of the area.
12. The nature and wilderness activities and motives of the respondents are obviously rather near to each other although physical exercise may be more emphasized among the nature visitors compared with the wilderness visitors. The cultural background can be clearly seen in the use of Finnish nature and wilderness areas. This means the traditional activities of hunting, fishing as well as collecting berries and edible mushrooms. The motives behind the activities have probably changed from the past to present day: hunting, fishing or collecting certain goods for living have lost their importance. Nowadays visits in nature are made mainly for the experiences of peace and silence, scenery, togetherness or physical exercise. The possibility to hunt, fish as well as to pick berries and mushrooms should be ensured in the political decision making. Possibilities for these common and traditional nature and wilderness activities should belong to everyone, in spite of the wealth of a person. The results that have been obtained in this study revealing the motives and activities of the Finnish people are consistent with some other researchers who have made their research among the Finnish people in the contexts of outdoor recreation or nature exercise.
13. Many similarities between the Finnish and Anglo-American concepts of wilderness as well as wilderness recreation can be found. However,

in the Finnish culture and traditions, wilderness is more like "the storehouse of backyard" than it is in the Anglo-American culture. Furthermore, the Finnish wilderness consists more clearly of forests and mires than the Anglo-American wilderness. For practical purposes this may mean that some features in our wilderness management, such as slight cuttings or some hunting traditions are perhaps not completely understood among the Anglo-American people. The opinions of these people should, however, be taken into consideration because they are our potential nature tourists. On the other hand, we should provide information about Finnish wilderness traditions and wilderness culture.

14. These results are only the preliminary results. The work should be continued in order to develop guidelines for the Finnish wilderness management strategy. First of all, the following topics should be important:

We should

- conduct research using qualitative methods as well as quantitative methods in order to get a deeper understanding of wilderness experience and the factors that have an effect on it.
- develop the mathematical scenic models for advanced computer-aided decision making.
- develop the methods to determine the wilderness character, or the other amenity values, of a forest area being composed of different forest stands.
- find out how a vast forest area should be managed to ensure the preservation, or improvement of the amenity values after forestry activities.
- expand wilderness research to understand the attitudes of foreign people towards Finnish wilderness areas and wilderness management.

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In the following questionnaire, there are questions and statements dealing with wilderness and the wilderness character of forests. Would you kindly answer all the questions and statements.

1. Please circle the alternative which correspond best your opinion in each of the following statements.

- The total extent of wilderness areas in Finland is:

1 Too high
2 Appropriate
3 Too small
4 I cannot say

- The total extent of protected wilderness areas in southern Finland (other administrative districts besides Oulu and Lapland) is:

1 Too high
2 Appropriate
3 Too small
4 I cannot say

- The total extent of protected wilderness areas in northern Finland (administrative districts of Oulu and Lapland) is:

1 Too high
2 Appropriate
3 Too small
4 I cannot say

2. Write on the following lines at most five words or short sentences which best describe the area that you call wilderness, please.

_____
_____
_____
_____
_____

3. Do you think that Finnish wilderness areas are worth preserving? *Draw a circle around the number of the alternative corresponding to your opinion.*

1. Yes, I think that Finnish wilderness areas are worth preserving.
   Why ?_____
2. No, I think that Finnish wilderness areas are not worth preserving.
   Why not?_____

4. Have you ever visited an area that you would call wilderness?

1. Yes, I have. The name of the area of my last wilderness visit is_____
2. No, I have not.

5. What is your favourite area that you regard as wilderness?

1. I like best of all the area called _____ wilderness.
2. I cannot say.

6. How much money would you would be willing to contribute towards the conservation of some of the Finnish wilderness areas if the money collection were organized during the summer 1990. *If you draw a circle around the alternative number one, please express the sum of the money using numbers.*

1. I would contribute _____ FIM towards the money collection for conservation. What is the name of the wilderness area you would be willing to promote by contributing the money?

   _____

2. I would not contribute money towards the purpose.

7. Would you sign a petition for the conservation of some of the Finnish wilderness areas if the collection of names were organized during the summer 1990?

1. Yes, I would sign a petition for conservation. What is the name of the wilderness area you would be willing to promote by your signature?

   _____

2. No, I would not sign the petition.

8. Please estimate how many kilometers you annually travel to reach wilderness areas for hiking, picking berries, fishing, hunting and so on? *If you draw a circle around the alternative number one, please put the number of kilometers on the adjacent line using numbers.*

1. I travel annually _____ kilometers in order to visit wilderness
2. I do not visit wilderness.

If you have drawn a circle around alternative number two, you can move to question number 13.

9. Please estimate how long your typical wilderness visit lasts? *Select only one of the alternatives.*

1. 2 hours
2. 5 hours
3. 10 hours
4. 1 night and day
5. 2 nights and days
6. 3 nights and days
7. 4 nights and days
8. 5 nights and days
9. 6 nights and days
10. 7 nights and days
11. 8–14 nights and days
12. 15 nights and days or more

10. Which of the following alternatives is your favourite accommodation when you stay overnight in wilderness? *Select only one of the alternatives, please.*

1. An open hut for common use, a reserved cabin or a cabin for rent
2. A tent or an open wind shelter ("laavu" or "loude")
3. I cannot say
4. I do not stay overnight in wilderness

11. Which of the following alternatives are your most important motives to visit wilderness? *Please select the three most important motives by giving them numbers in the following order: number 1 denotes the most important motive, number 2 the second most important motive and number 3 the third most important motive.*

___ Physical exercise
___ To test myself
___ Adventure
___ Beautiful scenery, the experience to stay the night in wilderness, to see plants and animals
___ The experience of peace and silence
___ The experience of solitude
___ The experience of togetherness with my family or friends
___ To get "prey" (game, berries or mushrooms, photographs and so on)
___ To exchange my experiences with other people
___ Some other motive? What?_____

12. Which of the following alternatives are your most important activities on wilderness visits? *Please, select the three most important activities by giving them the numbers in the following order: number 1 denotes the most important activity, number 2 the second most important activity and number 3 the third most important activity.*

___ To observe plants and animals and so on
___ Hunting and/or fishing
___ Photographing and/or painting pictures
___ Hiking and trekking
___ Some other activity. What?_____

13. Please select the alternative(s) among the following which you consider as appropriate in wilderness areas.

1. Marked paths or trails
2. Wooden paths crossing mires ("pitkospuut")
3. Ready-made campsites
4. Open huts for common use
5. Closed huts to be reserved or huts for rent
6. Cafeterias
7. Ski lifts

14. Let's assume that you are slowly hiking through roadless areas of different extents consisting of old, virgin forests. Please select from among the following which correspond to your mental image of hiking through the wilderness?

1. My hike through the area took 2 hours (I hiked 2 kilometers during the time)
2. My hike through the area took 5 hours (I hiked 4 kilometers during the time)
3. My hike through the area took 10 hours (I hiked 8 kilometers during the time)
4. My hike through the area took 24 hours (I hiked 16 kilometers during the time)
5. My hike through the area took 48 hours (I hiked 30 kilometers during the time)
6. My hike through the area took 100 hours (I hiked 60 kilometers during the time)
7. None of the areas is a wilderness. Why not?_____
   _____

15. Would you consider the areas that you called wilderness in the above question as wilderness if ....

– half of the areas consisted of young forest stands after cuttings and the other half consisted of old virgin forests?

1. Yes, I would consider all the areas as wilderness
2. I would consider the areas number _____ as wilderness
3. No, I would not consider any of the areas as wilderness

– the whole area consisted of young forest stands after cuttings

1. Yes, I would consider all the areas as wilderness
2. I would consider the areas number _____ as wilderness
3. No, I would not consider any of the areas as wilderness

– the whole area consists of old virgin forests but roads for timber transportation will be encounterd after every kilometer's walk

1. Yes, I would consider all the areas as wilderness
2. I would consider the areas number_____ as wilderness
3. No, I would not consider any of the areas as wilderness

16. You are making a hiking trip in a Finnish forest area. During the trip you encounter different forest stands. Let's assume that the different forest landscapes will promote or impair your wilderness experience. Select the alternative in each of the forest landscapes that would best correspond to the effect of the forest landscape on your wilderness experience. *Please, answer to all of the 17 landscapes.*

The landscape	Impair a lot	Impair consid-erably	Have no effect	Promote consid-erably	Promote a lot
Dense spruce forest, old and big trees, dead and fallen trees	–2	–1	0	1	2
Sparse pine forest, rather old and big trees	–2	–1	0	1	2
Sparse birch forest, rather old and big trees	–2	–1	0	1	2
Sparse pine forest, old big trees, dead andfallen trees	–2	–1	0	1	2
Dense spruce forest, rather old and big trees	–2	–1	0	1	2
Dense young pine stand, height of trees about 2 meters	–2	–1	0	1	2
Open area, fresh slash and stumps on the ground	–2	–1	0	1	2
Dense young spruce stand, height of trees about 2 meters	–2	–1	0	1	2
Open area, fresh stumps, ground has been burned	–2	–1	0	1	2
Sparse pine forest, old big trees, dead and fallen trees, road in the scenery	–2	–1	0	1	2
Sparse spruce forest, rather young and big trees, fresh slash and stumps on the ground	–2	–1	0	1	2
Dense spruce-hardwood mixed forest, old big trees, dead and fallen trees	–2	–1	0	1	2
Dense young birch stand, height of trees about 2 meters	–2	–1	0	1	2
Open mire, some scattered old low pines, some of them are dead	–2	–1	0	1	2
Open area, fresh slash and stumps on the ground as well as parallel furrows	–2	–1	0	1	2
Open mire, some scattered old low pines, some of them are dead, ditches in the scenery	–2	–1	0	1	2
Open area, some scattered old and big pines	–2	–1	0	1	2

Further, please answer some questions about you as a person.

17. I am 1. a man 2. a woman

18. I was born in the year _____

19. Besides me, my household consists of _____ adults (at least 18 years old) and _____ children (under 18 years old).

20. What is your latest education

1. Less than primary school
2. Primary school
3. Junior high school or comprehensive school
4. Junior high school or comprehensive school and vocational school or vocational courses
5. Junior high school or comprehensive school and college or institute level professional examination
6. High school graduation
7. High school graduation and vocational school or vocational courses
8. High school graduated and college or institute level professional examination
9. Academic degree

21. Which of the following socioeconomical groups do you think you represent?

1. The highest leadership
2. White-collar
3. Blue-collar
4. Student
5. Home-maker (full-time mother or father)

If you are a pensioner or unemployed at the time, select the group that you represented just before the pension or unemployment.

22. My occupation (or the occupation that I am studying at the time) is

_____

23. My residence is located in

1. A city or town. What city or town?
   _____
2. A village or another rather big center. What village or center?
   _____
3. The countryside. What is the municipality
   _____

24. Most of my childhood (my first fifteen years), I have spent in

1. A city or town. What city or town?
   _____
2. A village or another rather big center. What village or center?
   _____
3. The countryside. What is the municipality?
   _____

25. During my childhood, I have spent my time in nature or in the countryside

1. A lot
2. Some
3. Not at all

26. I felt that the questions in this questionnaire were

1. Easy to answer
2. Fairly easy to answer
3. Fairly difficult to answer
4. Very difficult to answer

Which of the questions were difficult to answer and why?

_____
_____
_____

27. Is there anything else that you would be willing to express about this questionnaire, wilderness areas or wilderness experience? This question is a voluntary question.

_____
_____
_____

THANK YOU FOR YOUR ANSWERS!

THE AMENITY VALUES OF FORESTS AND OUTDOOR RECREATION IN NATURE
The University of Joensuu/The Finnish Forest Research Institute

We kindly ask you to answer the following questions about your nature activities and your opinions about nature. Your answers will be handled confidentially.

You can answer the questions by writing the answer or drawing a circle (o), ticking off or numbering (1, 2, 3...) the alternative (or the alternatives) that corresponds best to your opinion.

1. I am 1. a man 2. a woman

I was born in the year_____

2. The municipality of my birth is_____

3. My household consists of/the number of my dependants is:

In addition to me my household does not include other persons___ (tick off)
Spouse ___ (tick off)
Sisters, brothers (half sisters, half brothers) _____ (number)
Children under 18 years (or dependants) _____ (number)
Other dependants _____ (number)
My parents or guardians _____ (number)

4. My occupation is/was or the occupation that I am studying :
Please describe the occupation as accurately as possible. If you have (or you have had) many occupations, write all the occupations on the lines (e.g. you have been in an occupation for several years and after that you have changed your occupation). If you are a full-time mother or father, please consider this duty as an occupation.

Occupation(s), or the occupation I am studying _____
Responsibility _____

During the last year I have been (tick off):

Working	____	On maternity leave	____
Full time mother/ father	____	On other leave	____
Studying	____	(e.g. leave of absence)	
Unemployed	____	Pensioner or retired	____

5. My highest educational degree is:

1. Less than primary school
2. Primary school
3. Primary school and vocational school or vocational courses
4. Junior high school or comprehensive school
5. Junior high school or comprehensive school and vocational school or vocational courses
6. Junior high school or comprehensive school and college or institute level professional education. Educational field_____
7. High school graduation
8. High school graduation and vocational school or vocational courses
9. High school graduation and college or institute level professional education. Educational field_____
10. Academic degree. Educational field and examination

_____

6. My permanent residence is located in:

1. a city or a town. The name of the city or the town_____
2. a village or other big densely populated community. The name of the municipality_____
3. the countryside. The name of the municipality

_____

7. I have spent my childhood and early youth (the first fifteen years) in:

1. a city or a town. The name of the city or the town_____
2. a village or another big densely populated community. The name of the municipality _____
3. the countryside. The name of the municipality

_____

8. During my childhood and early youth, I have spent my time in nature or in the countryside

1. a lot
2. sometime
3. not at all

9. Nowadays I visit nature (forests, lakes, rivers, fells, mires and so on):

	Never	Seldom	Rather often	Very often
In spring	____	____	____	____
In summer	____	____	____	____
In autumn	____	____	____	____
In winter	____	____	____	____

10. How often would you like to visit nature?

	Never	Seldom	Rather often	Very often
In spring	____	____	____	____
In summer	____	____	____	____
In autumn	____	____	____	____
In winter	____	____	____	____

11. Nowadays I visit nature (forests, lakes, rivers, mires, fells an so on). *Please note that you can select several alternatives.*

1. During evenings
2. During weekends
3. During holidays
4. When unemployed
5. When retired, pension
6. While working
7. Never

12. I would like to visit nature. *Please note that you can select several alternatives.*

1. During evenings
2. During weekends
3. During holidays
4. When unemployed
5. When retired or pension
6. While working
7. Never

13.The length of my previous annual vacation or my term leave (students) was _____ nights and days.

If you did not have annual vacation at all, you can move to question number 15.

14. The proportion of the previous annual vacation I spent in nature was:

1. Not at all
2. About 5 %
3. About 10 %
4. About 25 %
5. About 50 %
6. About 75 %
7. About 100 %

15. If I am or I have been retired or unemployed, I visit or I have visited nature during that time:

1. Never
2. Seldom (about once or twice a month)
3. Rather often (about once a week)
4. Very often (daily or at least nearly daily)
5. *I have not been retired or unemployed*

16. Which of the following alternatives describe the duration of your nature visits? *Note that you can select several alternatives.*

1. My nature visit takes some hours
2. My nature visit takes a day (5–10 hours)
3. My nature visit takes 1–2 nights and days (e.g. weekend visit)
4. My nature visit takes 3–6 nights and days
5. My nature visit takes 7 nights and days or more
6. I do not visit nature at all

17. Please estimate how many times you made nature visits of the following duration during the previous year?

1. Short visits (at most 10 hours): ____ visits
2. Medium length visits (1–2 nights and days): ____ visits
3. Long visits (3 nights and days or longer): ____ visits

18. What type of nature visits would you like to do? *Note that you can select several alternatives.*

	Easy	Challenging	None
1. Short visits (at most 10 hours):	____	____	____
2. Medium length visits (1–2 nights and days):	____	____	____
3. Long visits (3 nights and days or longer):	____	____	____

19. How do you prefer to spend the night in nature. P*lease select only <u>one</u> alternative.*

1. In an open hut, a hut to be reserved or a hut for rent.
2. In a tent or an open wind shelter ("laavu" or "loude")
3. In my own cabin
4. In a cabin for rent
5. I cannot say
6. I do not spend the night in nature

20. Which of the following alternatives are your most important motives to visit nature? *Please select the <u>three</u> most important motives by giving them the numbers in the following order: number 1 denotes the most important motive, number 2 the second most important motive and number 3 the third most important motive.*

____ To learn new things
____ The experience of freedom
____ Physical exercise
____ To test myself
____ Adventure
____ Beautiful scenery
____ Experiencing night in nature
____ To see plants and animals
____ To escape everydayness
____ The experience of peace and silence
____ The experience of solitude
____ The experience of togetherness with my family or friends
____ To get "prey" (hunt game, pick berries or mushrooms, take photographs and so on)
____ To exchange my experiences with other people
____ Some other motive? What?_____

21. Which of the following alternatives are your most important activities to visit wilderness? *Please, select the <u>three</u> most important activities by giving them the numbers in the following order: number 1 denotes the most important activity, number 2 the second most important activity and number 3 the third most important activity.*

____ Jogging, walking or track skiing
____ Hiking and trekking at least partly in nature including no paths or tracks
____ Hunting and/or fishing
____ Picking berries and/or edible mushrooms
____ Photographing and/or painting
____ Observing wild animals or plants
____ Some other activity. What?_____

22. Write on the following lines at most five words or short sentences describing best the area that you call wilderness, please.

1. _____
2. _____
3. _____
4. _____
5. _____

23. Have you ever visited an area that you would call wilderness?

1. Yes, I have.
   The name of the area of my last wilderness visit is
   _____.
   The municipality or municipalities where the area is situated is/are
   _____
2. No, I have not.

24. Do you think that wilderness conservation is important?

1. Wilderness conservation is very important because
   _____
2. Wilderness conservation is rather important because
   _____
3. Wilderness conservation is not important because
   _____

25. The total extent of wilderness areas in northern Finland (administrative districts of Oulu and Lapland) is:

1. Too high
2. Appropriate
3. Too small
4. I cannot say

And in the other parts of the country:

1. Too high
2. Appropriate
3. Too small
4. I cannot say

26. How important in your opinion is the wilderness character of nature for a visitor when he or she is making hiking trips of different duration?

	Not important at all	Rather important	Very important
1. Short visits (at most 10 hours):	1	2	3
2. Medium length visits (1-2 nights and days):	1	2	3
3. Long visits (3 nights and days or longer	1	2	3

27. What is your favourite nature area (whether you consider it wilderness or not)?

1. My favourite area is called _____. The municipality or the municipalities where the area is located is/ are _____
2. I cannot say

28. How much money would you be willing to contribute towards the conservation of some of the Finnish wilderness areas if the money collection were organized for the purpose?

1. I would donate _____ FIM. With my donation I would like to promote the protection of _____ _____ wilderness area situated in the municipality or municipalities of _____
2. No donation, because _____ _____

29. How do you experience the following constructions or management activities in wilderness? *If you cannot answer all the questions, you can move to the next construction/management activity.*

	Very negatively	Rather negatively	Have not an effect on the experience	Rather positively	Very positively
Marked paths or trail	–2	–1	0	1	2
Skiing tracks made by machines	–2	–1	0	1	2
Wooden paths crossing mires	–2	–1	0	1	2
Fish plantations by using rainbow trout	–2	–1	0	1	2
Constructed campsites	–2	–1	0	1	2
Signs along tracks	–2	–1	0	1	2
Open huts for common use	–2	–1	0	1	2
Closed huts to be reserved or huts for rent	–2	–1	0	1	2
Traditional Saami huts with some restaurant services	–2	–1	0	1	2
Rubbish collection	–2	–1	0	1	2
Fish plantations by using natural fish species	–2	–1	0	1	2

30. You have hiked for an hour in an old forest consisting of big pines and spruces. How do the following things that you encounter during your hike affect your wilderness experience? *If you cannot respond to all the points, you can move to the next.*

	Impairs very much	Impairs considerably	Has no effect	Promotes considerably	Promotes very much
During the hike, you...					
– reach a pond	–2	–1	0	1	2
– encounter a path	–2	–1	0	1	2
– encounter an old place of campfire	–2	–1	0	1	2
– encounter rocky terrain (big stones)	–2	–1	0	1	2
– encounter an old cabin made of gray snags	–2	–1	0	1	2
– reach a small open mire	–2	–1	0	1	2
– notice a bleached milk carton	–2	–1	0	1	2

.. continues	Impairs very much	Impairs consid-erably	Has no effect	Promotes consid-erably	Promotes very much
– encounter a new red cabin made of boards	–2	–1	0	1	2
– get lost	–2	–1	0	1	2
– encounter a road for timber transportation	–2	–1	0	1	2
– reach a small open area covered with stumps and slash	–2	–1	0	1	2
– reach a young pine stand	–2	–1	0	1	2
– reach a forest stand consisting of big birches	–2	–1	0	1	2
– reach a small meadow with an old shed covered with some mosses	–2	–1	0	1	2
– reach a stream	–2	–1	0	1	2
– encounter a winter track for timber transportation (a temporary track, usable only in wintertime)	–2	–1	0	1	2

I regarded the previous questions as

1. Very easy
2. Rather easy
3. Difficult
4. Very difficult

What questions were difficult and why?_____

_____

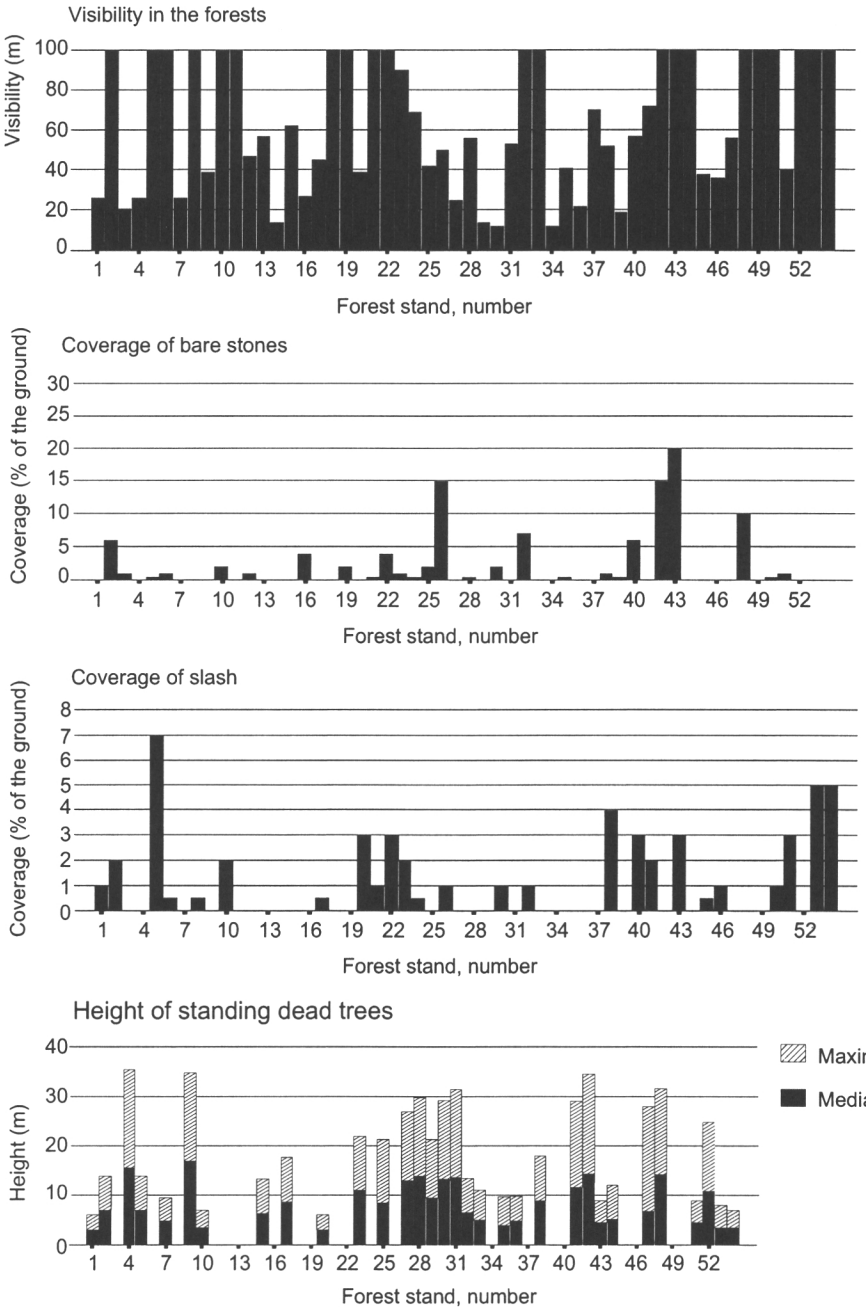
What else would you like to say about this questionnaire or some other things connected with this issue? _____

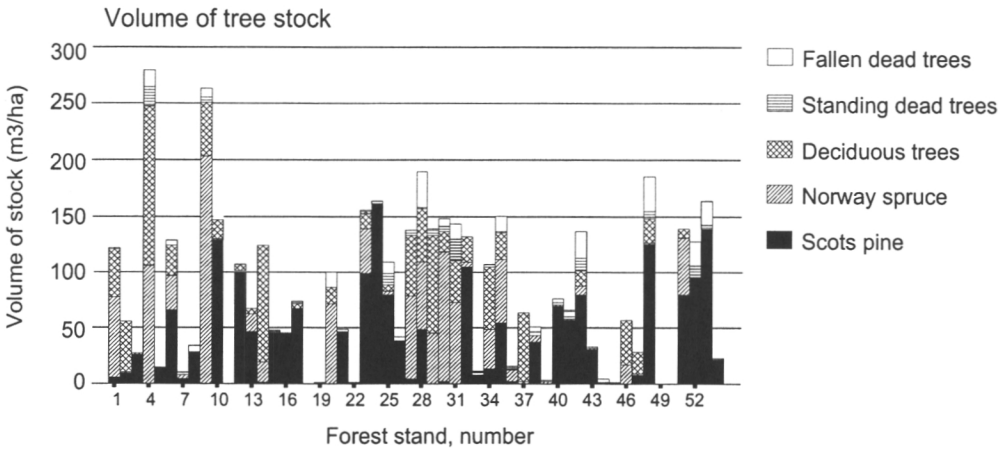
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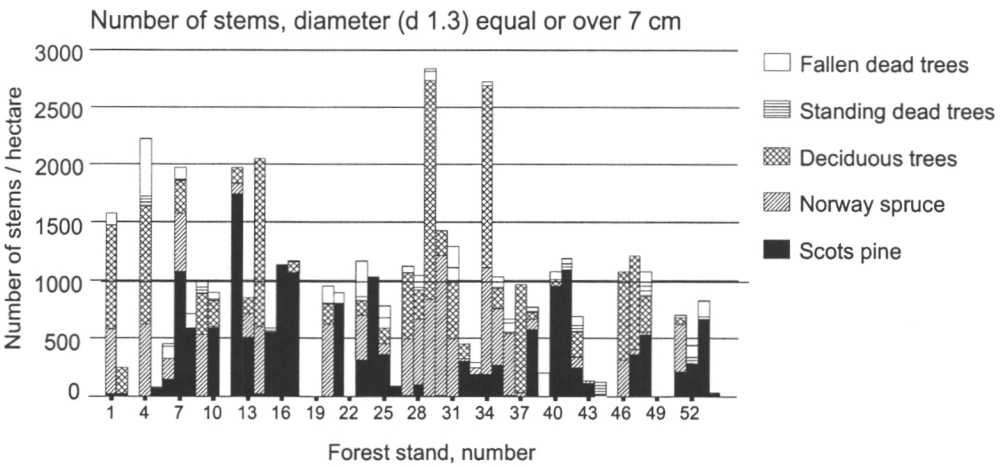
BEST THANKS FOR YOUR TROUBLE

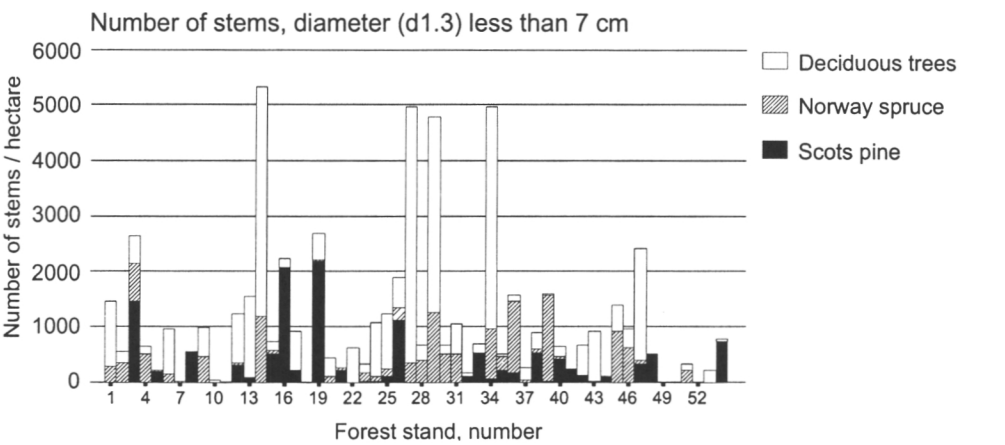
You have given unique and valuable information for Finnish forest research. We want to express our best thanks to you!

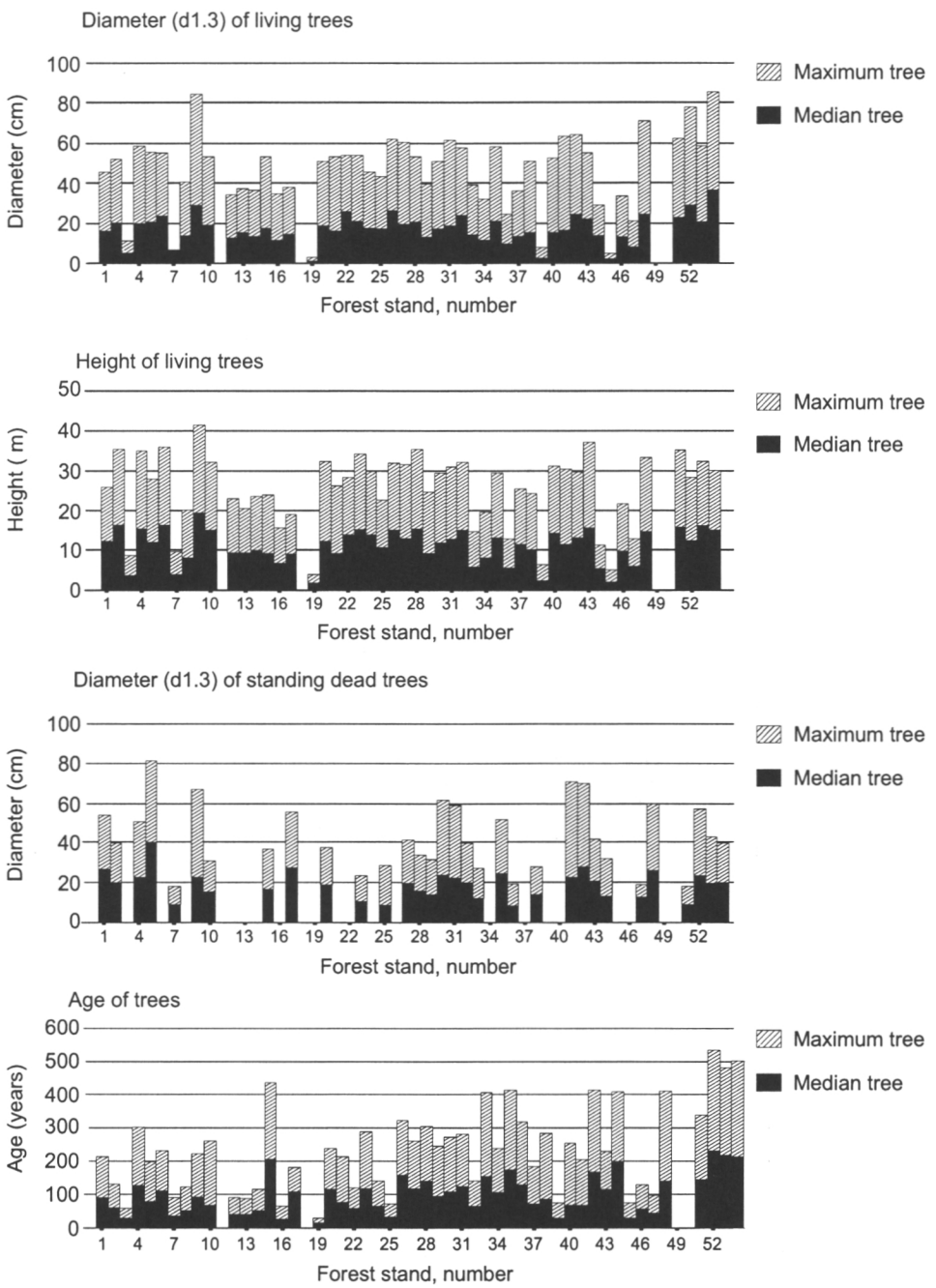
Ville Hallikainen and Jouni Puoskari
The University of Joensuu/The Finnish Forest Research Institute


Visibility in the forests
Visibility (m)
100
80
60
40
20
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Coverage of bare stones
Coverage (% of the ground)
30
25
20
15
10
5
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Coverage of slash
Coverage (% of the ground)
8
7
6
5
4
3
2
1
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Height of standing dead trees
Height (m)
40
30
20
10
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Maximum tree
Median tree


Volume of tree stock
Volume of stock (m3/ha)
300
250
200
150
100
50
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Fallen dead trees
Standing dead trees
Deciduous trees
Norway spruce
Scots pine


Number of stems, diameter (d 1.3) equal or over 7 cm
Number of stems / hectare
3000
2500
2000
1500
1000
500
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Fallen dead trees
Standing dead trees
Deciduous trees
Norway spruce
Scots pine


Number of stems, diameter (d1.3) less than 7 cm
Number of stems / hectare
6000
5000
4000
3000
2000
1000
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Deciduous trees
Norway spruce
Scots pine


Diameter (d1.3) of living trees
Diameter (cm)
100
80
60
40
20
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Maximum tree
Median tree
Height of living trees
Height (m)
50
40
30
20
10
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Maximum tree
Median tree
Diameter (d1.3) of standing dead trees
Diameter (cm)
100
80
60
40
20
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Maximum tree
Median tree
Age of trees
Age (years)
600
500
400
300
200
100
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52
Forest stand, number
Maximum tree
Median tree

Expressions describing wilderness in the open-ended definitional perception question of Data Set 1. Freq. denotes frequency of expression. Percent denotes the percent of the respondents that mentioned the expression.

Expression in Finnish	Expression in English	Freq.	%
Luonnontilainen	Area is in its natural state	394	48.94
Täysin asumaton	Completely uninhabited	277	34.41
Luonnontilainen vanha metsä	Old virgin forest	238	29.57
Täysin tietön	Completely roadless	139	17.27
Laaja-alainen	Vast	133	16.52
Hiljainen, rauhallinen	Peaceful, silent	102	12.67
Syrjäinen	Remote	101	12.55
Metsä (yleensä)	Forest (in general)	74	9.19
Ojittamaton suo	Mire without ditches	73	9.07
Suo (yleensä)	Mire (in general)	66	8.20
Runsaasti eliöitä	A lot of living organisms	64	9.75
Puhdas, saasteeton	Clean, without rubbish, unpolluted	60	7.45
Villieliöitä	Wild animals (or other living organisms)	54	6.71
Karu	Barren	52	6.46
Korpi	Spruce-hardwood growing mire	51	6.34
Järvi	Lake	29	3.60
Eliöitä	Living organisms	26	3.23
Metsä, jossa on keloja	Forest including dead trees (snags)	25	3.11
Metsä, jossa on vanhoja puita	Old forest	25	3.11
Rauhoitettu alue	Conservation area (nature preserve)	23	2.86
Vaihteleva, monipuolinen	Varying, many-sided	22	2.73
Lähes luonnontilainen	Area is near its natural state (natural)	21	2.61
Metsä, jossa on lahoja, kaatuneita puita	Forest including dead rotten and fallen trees	21	2.61
Tunturi	Fell	18	2.24
Synkkä, hämärä	Gloomy, dark	18	2.24
Havumetsä	Coniferous forest	16	1.99
Autio, aava	Desolate, open	16	1.99
Vaikeakulkuinen	Difficult to roam	16	1.99
Räme	Pine growing mire	16	1.99
Villi, kesyttämätön	Wild, untamed	16	1.99
Suojelu- ja virkistysrakenteita, polkuja on	Constructions and paths for recreation exist	15	1.86
Tiheä metsä	Dense forest	15	1.86
Joki, puro	River, stream	15	1.86
Varovasti käsitelty metsä	Slightly harvested forest	15	1.86
Yhtenäinen, kokonaisuus	Consistent, entirety	14	1.74
Kaunis	Beautiful	13	1.61
Harva tiestö	Not very many roads (sparse net of roads)	13	1.61

Expression in Finnish	Expression in English	Freq.	%
Lampi	Pond	13	1.61
Puuton tai vähäpuinen alue	Treeless area or sparse forest	13	1.61
Metsästykseltä rauhoitettu alue	Area where hunting is not allowed	12	1.49
Rakentamaton alue	Area without any constructions	12	1.49
Alkuperäinen, aito	Authentic, genuine	11	1.37
Metsä, jossa on suuria puita	Forest including big trees	11	1.37
Jylhä, mahtava	Rugged, mighty	11	1.37
Puhdas vesistö	Unpolluted river and lake system	11	1.37
Kaikkien käytettävissä virkistykseen	Common access for recreation	10	1.24
Vesistö (yleensä)	River and lake system (in general)	10	1.24
Runsaasti riistaeläimiä	A lot of game	9	1.12
Metsä, jossa on naavaisia puita	Forest including trees with epiphytic lichens	9	1.12
Sekametsä	Mixed forest	9	1.12
Vähän kulkijoita, yksinäisyys	Only some visitors, solitude	9	1.12
Luonnontilainen vesistö	River and lake system in its natural state	9	1.12
Kallio	Rock, cliff	9	1.12
Rehevä	Flourishing	8	1.00
Lähes asumaton	Nearly uninhabited	8	1.00
Ei vakituista asutusta	No permanent inhabitation	8	1.00
Luonnon ääniä	The voices of nature	8	1.00
Harvinaisia eliöitä	Uncommon living organisms	8	1.00
Saaristo	Archipelago	7	0.90
Saloseutu	Backwoods	7	0.90
Autiomaa, aavikko	Desert	7	0.90
Vaikeasti saavutettava	Difficult to reach	7	0.90
Kangasmaa	Mineral soil, heath	7	0.90
Suojelu- ja virkistysrakenteita ja polkuja ei ole	Area without any constructions or paths for recreation	6	0.75
Avosuo	Open mire	6	0.75
Taloudelliselta hyödyntämiseltä rauhoitettu	Area protected against economic utilization	5	0.62
Vapaa	Free	5	0.62
Kumpareinen maa	Terrain consists of hills	5	0.62
Eri-ikäinen puusto	Trees of different ages	5	0.62
Marjoja, sieniä	Berries, mushrooms	4	0.50
Julma, pelottava	Cruel, frightening	4	0.50
Metsät olleet kauan hakkaamattomina	Forests have not been cut for a long time	4	0.50
Eksyttävä, vaarallinen	Misleading, dangerous	4	0.50
Ei lainkaan kulkijoita	No visitors	4	0.50
Rentouttava	Relaxing	4	0.50
Kivinen maa	Stony terrain	4	0.50
Ryteikköinen metsä	Tangled forest	4	0.50

Expression in Finnish	Expression in English	Freq.	%
Vaaramaa	Wooded hills	4	0.50
Maa-alue	Area of land	3	0.37
Pelto, niitty	Field, meadow	3	0.37
Tarpeellinen, välttämätön	Necessary	3	0.37
Pohjoinen	Northern	3	0.37
Saavuttamaton, käymätön	Out of reach, never visited area	3	0.37
Harva metsä	Sparse forest	3	0.37
Tuntematon, tutkimaton	Unknown, unexplored area	3	0.37
Hoitamaton	Unmanaged	3	0.37
Tasapainoinen	Balanced	2	0.23
Talousmetsä	Commercial forest	2	0.23
Helppokulkuinen	Easy to roam	2	0.23
Luonnon kierrot toimivat	Ecological circulations work	2	0.23
Tuoksuva	Good smelling	2	0.23
Ihmiset ja eläimet tasavertaisia	Human beings and animal are equal	2	0.23
Kalaisa vesistö	Lake and river system full of fish	2	0.23
Kalastamaton vesistö	Never fished river and lake system	2	0.23
Alueella ei ole teollisuutta	No industry in the area	2	0.23
Ei yleisiä teitä	No roads for common use	2	0.23
Luonnon kehityksen tulos	The result of the evolution of nature	2	0.23
Maalle tunnusomainen	Typical for a country	2	0.23
Viljelemätön alue	Uncultivated area	2	0.23
Lannoittamaton metsä	Unfertilized forest	2	0.23
Hyödynnetty ilman jälkiä	Utilized area without any indication of utilization	2	0.23
Ikivanha	Ancient	1	0.12
Pohjoisella pallonpuoliskolla	Area is situated in the northern hemisphere	1	0.12
Kaira	Backwoods	1	0.12
Haasteellinen	Challenging	1	0.12
Hakkuuaukea	Clear-cut forest	1	0.12
Kuivuneita kantoja	Dried stumps	1	0.12
Vaivaiskoivu	Dwarf birch	1	0.12
Kuoleva	Dying	1	0.12
Riittävästi hyviä yöpymispaikkoja	Enough places to stay overnight	1	0.12
Eksoottinen	Exotic	1	0.12
Kohtalaisen helposti saavutettava	Fairly easy to reach	1	0.12
Lumoava	Fascinating	1	0.12
Tasainen	Flat	1	0.12
Metsä, jossa kolopuita	Forest including trees with holes	1	0.12
Raikas	Fresh	1	0.12
Tunnelmallinen	Full of feeling	1	0.12
Terve metsä	Healthy forest	1	0.12
Metsästys, kalastus ym. eränkäynti	Hunting and fishing etc.	1	0.12
Sokkeloinen	Labyrinthine	1	0.12
Jäkäläinen maa	Lichen-covered terrain	1	0.12

Expression in Finnish	Expression in English	Freq.	%
Luonnontuhoja	Natural damage (after storms, fire etc.	1	0.12
Alue lähes rakentamaton	Area nearly without construction	1	0.12
Aluetta ei omista kukaan	Nobody owns the area	1	0.12
Alue aitauksista vapaa	No fences exist in the area	1	0.12
Häiriintymätön maaperä	Undisturbed soil	1	0.12
Vanha	Old	1	0.12
Koski, putous	Rapids, waterfall	1	0.12
Tutkimusalue	Research area	1	0.12
Tervaskantoja	Resinous stamps	1	0.12
Jyrkkä pinnanmuodostus	Steep (sharp) topography	1	0.12
Metsäautoteitä on	Tracks for timber transportation exist	1	0.12
Rakentamaton vesistö	River and lake systems free from construction	1	0.12
Autiotupa	Wilderness hut for common use	1	0.12
Tuuli	Wind	1	0.12
Kävijä voi saada kaloja, esim. taimenia	Visitor can catch fish, for example trouts	1	0.12
Elinvoimainen	Vital	1	0.12

Expressions describing wilderness in the open-ended definitional perception question of Data Set 2. Freq. denotes frequence of expression. Percent denotes the percent of the respondents that mentioned the expression.

Expression in Finnish	Expression in English	Freq.	%
Täysin koskematon, luonnontilainen	Untouched, area in its natural state	150	45.60
Luonnontilainen, vanha metsä, aarniometsä	Old virgin forest	87	26.40
Hiljainen ja rauhallinen	Peaceful, silent	81	24.60
Syrjäinen	Remote	54	16.40
Täysin asumaton	Uninhabited	53	16.10
Karu	Barren	42	12.80
Täysin tietön	Roadless	41	12.50
Laaja-alainen	Vast	28	8.50
Suo (yleensä)	Mire (in general)	23	7.00
Puhdas, roskaton	Clean, without garbage	21	6.40
Metsä (yleensä)	Forest (in general)	20	6.10
Eläimiä	Animals	19	5.80
Metsä, jossa on keloja	Forest including dead trees or snags	19	5.80
Tunturi	Fell	18	5.50
Vaihteleva, monipuolinen	Varying, versatile	17	5.20
Villejä eliöitä	Wild living organisms	17	5.20

Expression in Finnish	Expression in English	Freq.	%
Metsä, jossa vanhoja puita	Forest including old trees	14	4.30
Metsä, jossa on lahoja ja kaatuneita puita	Forest including rotten and fallen trees	14	4.30
Ojittamaton suo	Mire without ditches	14	4.30
Tiheä metsä	Dense forest	12	3.60
Puuton tai vähäpuinen alue	Treeless area or area with sparse trees	12	3.60
Autio	Desolate	11	3.30
Runsaasti eläimiä	Lots of animals	10	3.00
Lähes koskematon, lähes luonnontilainen	Nearly untouched, area near its natural state	10	3.00
Niukka kasvillisuus	Scarce vegetation	10	3.00
Havumetsä	Coniferous forest	9	2.70
Vaikeakulkuinen	Difficult to roam	9	2.70
Harva metsä	Sparse forest	9	2.70
Poluton	Area without paths	8	2.40
Kuiva maaperä	Dry soil	8	2.40
Rehevä	Flourishing	8	2.40
Vähän kulkijoita, mahdollisuus yksinäisyyteen	Only a few visitors, opportunity for solitude	8	2.40
Räme	Pine-covered mire	8	2.40
Jylhä	Rugged	8	2.40
Metsä, jossa on suuria puita	Forest including big trees	7	2.10
Hoitamaton	Unmanaged	7	2.10
Luonnon äänet	Voices of nature	7	2.10
Yhtenäinen alue, ekologinen kokonaisuus	Consistent area, ecological entirety	6	1.80
Synkkä	Gloomy	6	1.80
Harvinaisia eliöitä	Rare (uncommon) living organisms	6	1.80
Kallioita	Rocks	6	1.80
Korpi	Spruce covered forest	6	1.80
Kivinen maa	Stony terrain	6	1.80
Puro, joki, koski	Stream, river, rapids	6	1.80
Avara	Wide	6	1.80
Runsaasti eliöitä	A lot of living organisms	5	1.50
Suvi-rakenteita, rakennettuja polkuja tai latuja on	Constructions, constructed paths and skiing tracts exist	5	1.50
Sekametsä	Mixed forest	5	1.50
Avosuo	Open mire	5	1.50
Rytekköinen metsä	Tangle of fallen trees	5	1.50
Monilajinen eliöstö	A lot of species of living organisms	4	1.20
Haasteellinen	Challenging	4	1.20
Metsä, jossa on naavaisia puita	Forest including trees with epiphytic lichens	4	1.20
Järvi	Lake	4	1.20
Lappi	Lapland	4	1.20

Expression in Finnish	Expression in English	Freq.	%
Eliöitä	Living organisms	4	1.20
Kansallispuisto	National park	4	1.20
Suojelualue	Protected area	4	1.20
Alkuperäinen, alkukantainen	Authentic, primitive	3	.90
Kaunis	Beautiful	3	.90
Metsä, jonka puusto on kuolemassa, kuolleita puita	Dying forest, dead trees	3	.90
Jäkäläinen maa	Earth covered with lichens	3	.90
Eri-ikäinen metsä	Forest including trees of different ages	3	.90
Vapaa	Free	3	.90
Tuoksuva	Good smelling	3	.90
Arvaamaton	Inestimable	3	.90
Paljon eläinlajeja	Many species of animals	3	.90
Ei kulkijoita	No visitors	3	.90
Vanha	Old	3	.90
Lampi	Pond	3	.90
Varovasti käsitelty hoitometsä	Slightly managed commercial forest	3	.90
Luonnonpuisto	Strict nature preserve	3	.90
Uhkaava, pelottava	Threatening, frightening	3	.90
Käsittelemätön maanpinta	Untouched soil surface	3	.90
Kuru	Valley	3	.90
Villi, kesyttämätön	Wild, untamed	3	.90
Ikivanha	Ancient	2	.60
Luontoon ja sen kiertoon kuuluva	Area belonging to nature and its ecological cycles	2	.60
Ei vakituista asutusta	Area without permanent inhabitation	2	.60
Hyödynnettäviä marjoja ja/tai sieniä	Berries and mushrooms that can be utilized	2	.60
Väritön	Colourless	2	.60
Rakentamiselta, taloudelliselta rauhoitettu	Constructions and commercial utilization forbidden	2	.60
Sammaleinen maa	Earth covered with mosses	2	.60
Lumoava	Fascinating	2	.60
Raikas	Fresh	2	.60
Kangasmaa	Heath, mineral soil	2	.60
Järvi ja lampi	Lake, pond	2	.60
Mahtava, vaikuttava	Mighty, impressive	2	.60
Hillasuo	Mire with lots of cloudberries	2	.60
Eksyttävä	Misleading	2	.60
Luonnollisesti uusiutuva	Natural regeneration	2	.60
Lähes asumaton, harvaan asuttu	Nearly uninhabited, sparse inhabitation	2	.60
Mukavaa	Nice	2	.60
Suvi rakenteita, rakennettuja polkuja tai latuja ei ole	No constructions, paths or tracks for recreation	2	.60
Vesistö (yleensä)	River and lake system (in general)	2	.60

Expression in Finnish	Expression in English	Freq.	%
Tuntematon ja tutkimaton alue	Unknown, unexplored area	2	.60
Auraamaton metsämaa	Unploughed forest soil	2	.60
Aarnialue	Virgin forest	2	.60
Vaaramaa	Wooded hills	2	.60
Runsaasti riistaeläimiä	A lot of game	1	.30
Paljon kasvilajeja	A lot of plant species	1	.30
Alueella luonnontilaisia osia	Area includes components in their natural state	1	.30
Ruskea	Brown	1	.30
Palanut metsä	Burned forest	1	.30
Tavallisia puulajeja	Common tree species	1	.30
Aavikko, autiomaa	Desert	1	.30
Vaikeasti saavutettavissa	Difficult to achieve	1	.30
Suoraan Luojan kädestä	Direct from the hands of God	1	.30
Luonnon kierrot toimivat	Ecological circulations function	1	.30
Klimax-vaiheessa oleva ekosysteemi	Ecosystem in its climax state	1	.30
Tyhjä	Empty	1	.30
Tasainen maa	Flat terrain	1	.30
Luotaantyöntävä	Forbidding	1	.30
Yhden puulajin metsä	Forest including only one tree species	1	.30
Valjastamaton vesistö	Free flowing river and lake system	1	.30
Vouhotus	Fuss	1	.30
Riistaeläimiä	Game	1	.30
Maistuva	Good tasting	1	.30
Lehto	Grove	1	.30
Saari meressä tai järvessä	Island in a lake or sea	1	.30
Kumpareinen maa	Knoll terrain	1	.30
Järvi ja joki	Lake and River	1	.30
Valoisa	Light	1	.30
Pounikko	Mire with lots of hummocks	1	.30
Salaperäinen	Mysterious	1	.30
Luonto (yleensä)	Nature (in general)	1	.30
Ei ruohoa	No grass	1	.30
Ei koneita	No machines	1	.30
Ei pinoja	No piles of wood	1	.30
Ei valmiita majoitteita	No built construction for staying overnight	1	.30
Ei avohakkuita	No clearcuts	1	.30
Ei kehitysluokkia	No development class of trees	1	.30
Ei liikaa matkailijoita	Not too many tourists	1	.30
Alue ei hyötykäytössä	Not utilized area	1	.30
Aukeahko suo, jossa kituvia mäntyjä	Open mire with some scattered stunted pines	1	.30
Mahdollisuus rakentaa nuotio	Opportunity to build a fire	1	.30
Metsälampi	Pond in a forest	1	.30

Expression in Finnish	Expression in English	Freq.	%
Poro	Reindeer	1	.30
Rentouttava	Relaxing	1	.30
Kehityksen hidastaja	Restraint of development	1	.30
Linnunlaulu	Song of birds	1	.30
Harva tiestö	Sparse road net (not many roads)	1	.30
Aro	Steppe	1	.30
Typerää	Stupid	1	.30
Sopiva retkeilyyn ja ulkoiluun	Suitable for hiking, outdoor recreation	1	.30
Kaupungin vastakohta	The opposite of town or city	1	.30
Ajattomuus	Timelessness	1	.30
Puron solinaa, kosken kohinaa	Tinkle of stream, rush of rapids	1	.30
Itsensä kokeminen pieneksi	To feel myself small	1	.30
Sammaloituneita puita	Trees covered with mosses	1	.30
Rakentamaton (yleensä)	No construction (in general)	1	.30
Kalastamaton vesistö	Unfished river and lake system	1	.30
Armoton	Unmerciful	1	.30
Käymätön alue	Unvisited area	1	.30
Rahan tuhlaus	Waste of money	1	.30
Avara maisema	Wide landscape	1	.30
Petoeläimiä	Wild beasts	1	.30
Elinvoimainen metsä	Vital forest	1	.30

FINNISH WILDERNESS AREAS LISTED BY ADMINSTRATIVE DISTRICTS AND IN THE WHOLE COUNTRY

Wilderness areas or municipalities by administrative districts	Frequency
The district of Uusimaa	
Nuuksio National Park, Espoo	4
Sipoo	2
The archipelago of the Gulf of Finland	2
Kytäjä, forest area, Hyvinkää	1
Luukki, Espoo	1
Sveitsi, Hyvinkää	1
The district of Turku and Pori	
Seitseminen National Park	9
Ahlstöm forest, Noormarkku	1
An island near Reposaari	1
Kurjenrahka National Park	1
Käskynvuori, Kihniö	1
Putsaari, Uusikaupunki	1
Raasinkorpi, Yläne	1
Rauma (archipelago)	1
Saaristomeri National Park	1
The outer archipelago of Turku	1
Vaskijärvi Strict Nature Preserve	1
Vast mire in Varsinais-Suomi	1
The district of Häme	
Seitseminen National Park	9
Helvetinjärvi National Park	3
Ruovesi	2
Evo, a virgin forest preserve in the forest of the forest college of Evo, Lammi	1
Isojärvi National Park	1
Kangasala	1
Laippa, Etelä-Häme	1
Laukko Nature Preserve, Vesilahti	1
Liesjärvi National Park	1
Siikaneva Mire Preserve, Ruovesi	1
Sinivuori Strict Nature Preserve	1
Tammela	1
Torronsuo National Park	1
Vahtervehmas, Lammi	1

The district of Kymi

Pahkajärvi, Vekarajärvi, Valkeala	4
Saimaa	2
Jukajärvi, Ruokolahti	1
Kesäranta, Nature Preserve, Hamina	1
Luumäki, Valkeala (a forest covered with lots of blueberries)	1
Repovesi, Valkeala	1
Ruokolahti (heath)	1
Valkeala	1

The district of Mikkeli

Kolovesi National Park	3
Punkaharju, Savonlinna	2
Saimaa	2
Haukivesi, Savonlinna, Varkaus etc.	1
Kangasniemi	1
Linnasaari National Park	1
Mikkeli rural district.	1
Pahkajärvi, Valkeala, Mäntyharju (southern parts)	1
Puumala	1
Päijätsalo, Sysmä	1
Savonlinna	1
Suruaanlahti, Mäntyharju	1
Sysmä	1
Vuorisalo, Sysmä	1

The district of North-Karelia

Patvinsuo National Park	7
Ilomantsi	5
Kesonsuo Nature Preserve, Ilomantsi	3
Petkeljärvi National Park	2
Eimisjärvi, Tuupovaara	1
Eno	1
Ilomantsi, a mire covered with a lot of cloudberries	1
Jaamankangas, Kontiolahti	1
Juuka (almost wilderness)	1
Kiihtelysvaara	1
Koitajoki, Ilomantsi	1
Koli National Park	1
Kolvananuuro, Kontiolahti	1
Mujejärvi, Nurmes	1
Möhkö, Ilomantsi	1
Naarva, Ilomantsi	1
Nurmes (a pond in a forest, mire)	1
Ruunaa Recreation Area, Lieksa	1
Sarvinki, Eno	1
Sivakansalo, Valtimo	1

Tuupovaara	1
Valtimo	1

The district of Kuopio

Talaskangas, Vieremä	5
Rautavaara	2
Tiilikkajärvi National Park	2
Haukivesi, Savonlinna, Varkaus etc.	1
Iisalmi (southwestern parts)	1
Kakkinen, Karttula	1
Nilsiä	1
Nilsiä, uninhabited areas	1
Rautalampi	1
Sonkajärvi	1
Sukeva, Sonkajärvi	1
Varkaus	1
Volonsuo, Vieremä	1

The district of Middle-Finland (Keski-Suomi)

Pyhä-Häkki National Park	10
Isojärvi National Park	3
Koirajärvi, Kinnula	1
Konginkangas (nature preserve)	1
Kulha, Multia	1
Saarijärvi, Konginkangas	1
Salamajärvi National Park	1
Southern backwoods, Reisijärvi, Pihtipudas, Kinnula, (Lestijärvi)	1

The district of Vaasa

Lauhavuori National Park	2
Hongisto, Toholampi, Ullava	1
Ilmajoki (a pond, a mire, a forest)	1
Karhunmaa, Kauhajoki	1
Maxmo	1
Pirttimaa, Kurikka	1
Salamajärvi National Park	1
Vionneva, Ullava	1

The district of Oulu

Oulanka National Park	16
Kuusamo	13
Hossa Recreation Area, Suomussalmi	7
Julma-Ölkky, Kuusamo	4
Martinselkonen, Suomussalmi	4
Elimyssalo (Ystävyyden puisto), Kuhmo	3
Hiidenportti National Park	2
Iso-Syöte, Pudasjärvi	2

Suomussalmi	2
Ulvinsalo Strict Nature Preserve, Kuhmo	2
Hailuoto (a mire)	1
Hiisijärvi, Ristijärvi	1
Iijoki	1
Isovaara, Pudasjärvi	1
Jonkerinsalo, Kuhmo	1
Kitkajoki, Kuusamo	1
Kivarijoki, itäpuoli, Pudasjärvi	1
Koiravaaransalo, Kuhmo	1
Kolmiloukko, Taivalkoski	1
Korpinen, Pudasjärvi	1
Kuhmo	1
Kuhmo, a virgin forest preserve	1
Kuumu, Kuhmo	1
Kuusamo (30 km south of the town)	1
Kylmäluoma Recreation Area, Taivalkoski	1
Lapiosuo Mire Preserve, Ranua, Pudasjärvi	1
Latva, Kouva, Pudasjärvi	1
Liminka (a mire)	1
Lusminki, Kuusamo	1
Oulu (5 km from the town)	1
Palovaara, Piltua, Oravisuo mire preserve, Pudasjärvi	1
Pieni Käkiräme, Iso Käkiräme, Merijärvi	1
Piikslammi, Kuusamo	1
Potkujärvi, Vaala	1
Pulkkila	1
Puolanka (calming, silent, the voices of nature)	1
Pyhitysvaara, Taivalkoski	1
Pyhäjärvi	1
Rintajärvi, Kuusamo	1
Rokuansuo, Vaala	1
Rukatunturi, Kuusamo	1
Ruukki	1
Sanginjoki, Muhos, Ylikiiminki	1
Sievi	1
Sopenmäki, Vaala	1
Sotkamo	1
Southern backwoods, Reisijärvi, Pihtipudas, Kinnula, (Lestijärvi)	1
Suomussalmi (near the border between Finland and Russia)	1
Suomussalmi (northeastern parts)	1
Torajärvi, Kuivaniemi	1
Utajärvi, Puolanka, Pudasjärvi	1
Utos-backwoods, Utajärvi	1
Vihanti	1

The district of Lapland

UKK-National Park	31
Oulanka National Park	16
Ylläs-Pallas Naturally Managed Forest area, Kittilä, Kolari, Muonio	9
Pallas-Ounastunturi National Park	8
Kilpisjärvi high fells, Enontekiö	7
Kessi-Vätsäri, Inari	6
Käsivarsi, Enontekiö	6
Tuntsa-Naruska, Salla	6
Pyhätunturi National Park	5
Inari	3
Ivalon alue, Inari	3
Kevo Strict Nature Preserve	3
Luosto-Pyhätunturi Naturally Managed Forest Area, Sodankylä, Pelkosenniemi	3
Pomokaira, Sodankylä	3
Enontekiö	2
Kittilä	2
Lätäseno, Enontekiö	2
Muotkatunturi Statutory Wilderness Area, Inari, Utsjoki	2
Pelkosenniemi	2
Riisitunturi National Park	2
Salla	2
A skiing centre	1
Autti, Rovaniemi rural district.	1
Fells	1
Hammastunturi Statutory Wilderness Area, Inari, Sodankylä	1
Inari	1
Ivalonjoki, Inari	1
Kaamanen, Inari	1
Kaarestunturi, Sodankylä	1
Kemijärvi	1
Kemijärvi, Salla	1
Keminmaa	1
Kivalot, Keminmaa, Simo, Tervola	1
Koitelaiskaira proposed nature preserve, Sodankylä	1
Kolari	1
Kotakulha, Ylitornio	1
Lapiosalmi, Posio	1
Lapiosuo Mire Preserve, Ranua, Pudasjärvi	1
Lemmenjoki National Park	1
Luola-aapa, Simo, Torajärvi, Kuivaniemi	1
Malla Strict Nature Preserve	1
Meneslatva-Karvaselkä-Haipparova, Inari	1
Military activities during the Second World War in Lapland	1
Military repetition activities	1

Nellimö, Inari	1
Peräposio, Posio, Kuusamo	1
Pielpajärvi,Inari	1
Reutuaapa, Suolijoki, Tervola	1
Rovaniemi, Kemijärvi	1
Savukoski	1
Sodankylä (a mire cowered lots of cloudberries)	1
Sompionkaira, Sodankylä	1
Tunturialue Lapissa	1
Tunturialue Pohjois-Lapissa	1
Ukonjärvi, Inari	1
Utsjoki	1
Vetsikko, Utsjoki	1
Vilman kaira, Salla	1
Värriökaira, Salla	1
Äkäslompolon, Kittilä, Kolari, Kittilä	1

AREAS IN THE WHOLE COUNTRY

UKK-National Park	31
Oulanka National Park	16
Kuusamo	12
Pyhä-Häkki National Park	10
Seitseminen National Park	9
Ylläs-Pallas Naturally Managed Forest Area, Kittilä, Kolari, Muonio	9
Pallas-Ounas National Park	8
Hossa Recreation Area, Suomussalmi	7
Kilpisjärven high fells, Enontekiö	7
Patvinsuo National Park	7
Kessi-Vätsäri, Inari	6
Käsivarsi, Enontekiö	6
Tuntsa-Naruska, Salla	6
Ilomantsi	5
Pyhätunturi National Park	5
Talaskangas, Vieremä	5
Julma-Ölkky, Kuusamo	4
Martinselkonen, Suomussalmi	4
Nuuksio, Espoo	4
Pahkajärvi, Vekarajärvi, Valkeala	4
Elimyssalo (Ystävyyden puisto), Kuhmo	3
Helvetinjärvi National Park	3
Inari	3
Isojärvi National Park	3
Ivalon alue, Inari	3
Kesonsuo Nature Preserve, Ilomantsi	3
Kevo Strict Nature Preserve	3
Kolovesi National Park	3

Luosto-Pyhätunturin Naturally Managed Forest Area, Sodankylä, Pelkosenniemi	3
Pomokaira, Sodankylä	3
Enontekiö	2
Hiidenportti National Park	2
Iso-Syöte, Pudasjärvi	2
Kittilä	2
Lauhavuori National Park	2
Lätäseno, Enontekiö	2
Muotkatunturit Statutory Wilderness Area, Inari, Utsjoki	2
Petkeljärvi National Park	2
Punkaharju, Savonlinna	2
Rautavaara	2
Riisitunturi National Park	2
Ruovesi	2
Saimaa	2
Salla	2
Sipoo	2
Suomussalmi	2
The archipelago of the Gulf of Finland	2
Tiilikkajärvi National Park	2
Ulvinsalo Strict Nature Preserve, Kuhmo	2
Pelkosenniemi	2
A fell area in Lapland	1
A skiing centre in Lapland	1
A vast mire in Varsinais-Suomessa	1
Ahlstöm Forest Area, Noormarkku	1
An island near Reposaari	1
Autti, Rovaniemi rural district	1
Eimisjärvi, Tuupovaara	1
Eno	1
Evo, a virgin forest preserve in the forest of the Evo Forest College, Lammi	1
Fell areas in northern Lapland	1
Fells	1
Hailuoto (a mire)	1
Hammastunturi Statutory Wilderness Area, Inari, Sodankylä	1
Haukivesi, Savonlinna, Varkaus etc.	1
Hiisijärvi, Ristijärvi	1
Hongisto, Toholampi, Ullava	1
Iijoki	1
Iisalmi (southwestern parts)	1
Ilmajoki (a pond, a mire, a forest)	1
Ilomantsi, a mire covered with lots of cloudberries	1
Inari	1
Isojärvi National Park	1
Isovaara, Pudasjärvi	1

Ivalonjoki, Inari 1
Jaamankangas, Kontiolahti 1
Jonkerinsalo, Kuhmo 1
Jukajärvi, Ruokolahti 1
Juuka (almost wilderness) 1
Kaamanen, Inari 1
Kaarestunturi, Sodankylä 1
Kakkinen, Karttula 1
Kangasala 1
Kangasniemi 1
Karhunmaa, Kauhajoki 1
Kemijärvi 1
Kemijärvi, Salla 1
Keminmaa 1
Kesäranta, nature preserve, Hamina 1
Kiihtelysvaara 1
Kitkajoki, Kuusamo 1
Kivalot, Keminmaa, Simo, Tervola 1
Kivarijoki, itäpuoli, Pudasjärvi 1
Koirajärvi, Kinnula 1
Koiravaaransalo, Kuhmo 1
Koitajoki, Ilomantsi 1
Koitelaiskaira proposed nature preserve, Sodankylä 1
Kolari 1
Koli National Park 1
Kolmiloukko, Taivalkoski 1
Kolvananuuro, Kontiolahti 1
Konginkangas (nature preserve) 1
Korpinen, Pudasjärvi 1
Kotakulha, Ylitornio 1
Kuhmo 1
Kuhmo (a virgin forest preserve) 1
Kulha, Multia 1
Kurjenrahka National Park 1
Kuumu, Kuhmo 1
Kuusamo (30 km south of the town) 1
Kylmäluoma Recreation Area, Taivalkoski 1
Kytäjä, metsäalue, Hyvinkää 1
Käskynvuori, Kihniö 1
Laippa, Etelä-Häme 1
Lapiosalmi, Posio 1
Lapiosuo Mire Preserve, Ranua, Pudasjärvi 1
Latva, Kouva, Pudasjärvi 1
Laukko Nature Preserve, Vesilahti 1
Lemmenjoki National Park 1
Liesjärvi National Park 1
Liminka (a mire) 1

Linnasaari National Park	1
Luola-aapa, Simo, Torajärvi, Kuivaniemi	1
Lusminki, Kuusamo	1
Luukki, Espoo	1
Luumäki, Valkeala (a forest covered with lots of blueberries)	1
Malla Strict Nature Preserve	1
Maxmo	1
Meneslatva-Karvaselkä-Haipparova, Inari	1
Mikkeli rural district	1
Military activities during the Second World War in Lapland	1
Military repetition activities	1
Mujejärvi, Nurmes	1
Mäntyharju (southern parts)	1
Möhkö, Ilomantsi	1
Naarva, Ilomantsi	1
Nellimö, Inari	1
Nilsiä	1
Nilsiä, uninhabited areas	1
Nurmes (a pond in a forest, a mire)	1
Oulu (5 km from the town)	1
Palovaara, Piltua, Oravisuo Mire Preserve, Pudasjärvi	1
Peräposio, Posio	1
Pielpajärvi,Inari	1
Pieni Käkiräme, Iso Käkiräme, Merijärvi	1
Piikslammi, Kuusamo	1
Pirttimaa, Kurikka	1
Potkujärvi, Vaala	1
Pulkkila	1
Puolanka (calming, silent, the voices of nature)	1
Putsaari, Uusikaupunki	1
Puumala	1
Pyhitysvaara, Taivalkoski	1
Pyhäjärvi	1
Päijätsalo, Sysmä	1
Raasinkorpi, Yläne	1
Rauma (archipelago)	1
Rautalampi	1
Repovesi, Valkeala	1
Reutuaapa, Suolijoki, Tervola	1
Rintajärvi, Kuusamo	1
Rokuansuo, Vaala	1
Rovaniemi, Kemijärvi	1
Rukatunturi, Kuusamo	1
Ruokolahti (a heath)	1
Ruukki	1
Ruunaa Recreation Area, Lieksa	1
Saarijärvi, Konginkangas	1

Saaristomeri National Park	1
Salamajärvi National Park	1
Sanginjoki, Muhos, Ylikiiminki	1
Sarvinki, Eno	1
Savonlinna	1
Sievi	1
Siikaneva, Ruovesi	1
Sinivuori Strict Nature Preserve	1
Sivakansalo, Valtimo	1
Sodankylä (a mire covered with lots of cloudberries)	1
Sompionkaira, Sodankylä	1
Sonkajärvi	1
Sopenmäki, Vaala	1
Sotkamo	1
Southern backwoods, Reisijärvi, Pihtipudas, Kinnula, (Lestijärvi)	1
Sukeva, Sonkajärvi	1
Suomussalmi (near the border between Finland and Russia)	1
Suomussalmi (northeastern parts)	1
Suruaanlahti, Mäntyharju	1
Sveitsi, Hyvinkää	1
Sysmä	1
Tammela	1
The outer archipelago of Turku	1
Torajärvi, Kuivaniemi	1
Torronsuo National Park	1
Tuupovaara	1
Ukonjärvi, Inari	1
Utajärvenpuoleinen erämaa, Puolanka, Pudasjärvi	1
Utos-sydänmaa, Utajärvi	1
Utsjoki	1
Vahtervehmas, Lammi	1
Valkeala	1
Valtimo	1
Varkaus	1
Vaskijärvi Strict Nature Preserve	1
Vetsikko, Utsjoki, Savukoski	1
Vihanti	1
Vilman kaira, Salla	1
Vionneva, Ullava	1
Volonsuo, Vieremä	1
Vuorisalo, Sysmä	1
Värriökaira, Salla	1
Äkäslompolo, Kittilä, Kolari, Kittilä	1

The reasons for wilderness preservation that have been mentiones by the respondents of Data Set 1. The number of obervations denotes how many times the reason has been mentioned, and the percent of cases denotes what percentage of the respondents have mentioned the reason.

Reason for wilderness preservation	Number of observations	Percent of cases
The conservation of speces	240	31.70
To preserve wilderness for future generations	176	23.30
Recreational use of wilderness areas	170	22.50
The function of the biosphere, ecological balance	78	10.30
To preserve naturalness	69	9.10
Wilderness is a part of nature	39	5.20
We have so few wilderness areas left	33	4.40
To keep nature unpolluted	28	3.70
The originality of nature	28	3.70
A human needs pristine nature	27	3.60
Wilderness is important to the Finnish culture	23	3.00
Wilderness is important to research	23	3.00
The conservation of Finnish forests	17	2.20
Wilderness supports human activities like hunting and so on	17	2.20
Wilderness is unique, irreparable	16	2.10
To preserve areas outside of areas of silvicultural activities	16	2.10
The beautu of nature, beautiful landscapes	15	2.00
Wilderness is important for nature hobbies and nature education	15	2.00
Wilderness areas are "ecological museums"	11	1.50
Research of natural succession	8	1.10
In a sparsely inhabited country like Finland, it is easy to preserve wildernesses	8	1.10
Wilderness areas are reference areas for managed areas	7	.90
To preserve areas without any buildings or other urban constructions	7	.90
To preserve original nature is humankind's duty	6	.80
The growing importance and value of wilderness	6	.80
To preserve the biodiversity of nature	5	.70
The intrinsic values of wilderness	3	.40
For the people of the countries with no wilderness areas	3	.40
To preserve the nature resources of wilderness for future use	3	.40
Wilderness is important in the defence of the country	3	.40
Wilderness is important for traditional sources of livelihood	2	.30
To prevent the spread of deserts	1	.10
To preserve roadless areas	1	.10
To see how easily old wilderness forests can be destroyed by natural damage	1	.10
Pollutants are threatening wilderness areas	1	.10
Wilderness areas are renewed very slowly	1	.10

The reason for wilderness conservation that have been mentioned by the respondents of Data Set 2. The number of observations denotes how many times the reason has been mentioned, and the percent of cases denotes what percentage of the respondents have mentioned the reason.

Reason for wilderness conservation	Number of observations	Percent of cases
The conservation of speces	54	19.90
To preserve naturalness	44	16.20
To preserve wilderness for future generations	40	14.70
Recreational use of wilderness areas	45	12.90
Wildernesses will be destroyed without any conservation	28	10.30
We have so few wilderness areas left	18	6.60
The originality of nature	14	5.10
The conservation of forests	13	4.80
The beauty of nature, beautiful landscapes	12	4.40
A human needs pristine nature	9	3.30
The function of the biosphere, ecological balance	7	2.60
To preserve biodiversity	6	2.20
Wilderness areas are "ecological museums"	5	1.80
Wilderness areas are reference areas for managed areas	4	1.50
The areas that cannot be utilized eocnomically can be preserved	4	1.50
To keep nature unpolluted	3	1.10
Wilderness is a part of nature	3	1.10
Wilderness is a typical part of Finnish nature	3	1.10
Wilderness is unique, irreparable	3	1.10
Wilderness is important to Finnish culture	3	1.10
To preserve original nature is humankind's duty	2	.70
Wilderness supports human activities like hunting and so on	2	.70
Wilderness is important to research	2	.70
Wilderness is important for nature hobbies and nature education	1	.40
Research of natural succession	1	.40
To preserve areas without any buildings or urban constructions	1	.40
To preserve areas outside of areas of silvicultural activities	1	.40
In wilderness one can experience something very ancient	1	.40
Wilderness areas can be easily destroyed	1	.40
Wilderness areas are fascinating	1	.40
The need of areas without human beings	1	.40
To protect areas against recreational use	1	.40
Natural resources have to be used according to conditions of nature	1	.40
To protect areas against economic uses	1	.40
Wilderness is important to the reputation of the country	1	.40

The reasons why wilderness preservation is not important as mentioned by the respondents of Data Set 1. The number of observations denotes how many times the reason has been mentioned, and the percent of cases denotes what percentage of the respondents have mentioned the reason.

Reasons why wilderness preservation is not important	Number of observations	Percent of cases
Pollutants destroy wilderness areas	5	21.70
Wilderness forests become old and therefore have to be regenerated	4	17.40
Wilderness preservation is not economically cost effective	4	17.40
All, or at least nearly all of the wilderness areas have already been destroyed	3	13.00
Wilderness areas are not threatened	2	8.70
Dangerous animals breed in wilderness areas	1	4.30
Local inhabitants suffer when wilderness areas are protected	1	4.30
Wilderness areas are giving rise to fights	1	4.30
People become hermits in wilderness	1	4.30
People get lost in wilderness	1	4.30
Finland is such a tiny country, one should conserve the whole country	1	4.30
The whole of Finland is wilderness	1	4.30
Because the wilderness concept is so vague, wilderness cannot be destroyed	1	4.30

The reason why wilderness preservation is not important as mentioned by the respondents of Data Set 2. The number of observations denotes how many times the reason is mentioned, and the percent of cases denotes what percentage of the respondents have mentioned the reason.

Reasons for wilderness conservation	Number of observations	Percent of cases
Wilderness forests become old and therefore have to be regenerated	1	14.30
Pollutants destroy wilderness areas	1	14.30
Wilderness areas have to be destroyed	1	14.30
Wilderness areas need some management acitivities	1	14.30
We have such large forest areas	1	14.30
A man cannot hunt in nature conservation areas	1	14.30

Summary in Finnish

Suomalainen erämaakokemus

Ihmisen luontoa muuttava toiminta on lisännyt keskustelua erämaiden merkityksestä, hoidosta ja käytöstä. Erämaat ovat tärkeitä myös luontomatkailulle. Suomalaisen erämaakäsitteen juuret ulottuvat keskiaikaiseen eräkauteen, jolloin oli jo syntynyt pysyvää asutusta ja maanviljelystä. Erämaat erillisinä, osittain jaettuina, pyytöalueina talojen ja kylien ympäristössä saivat merkityksensä uutta kulttuurikehystä vasten. Jo tuolloin erämaat olivat arvokkaita alueita suomalaisille. Tosin alueita myös pelättiin eikä erämaamaisemaa arvostettu samalla tavalla kuin nykyään. Erämaakäsitteen kulttuurinen tausta vaikuttanee ihmisten nykyisiin erämaamielikuviin yhtenäistäen niitä. Suomen erämaat on määritelty lainsäädännössä. Kuitenkaan ei ole itsestään selvää, että yksittäisten ihmisten erämaamielikuvat ja lakisääteiset erämaat vastaavat toisiaan.

Monille nykyihmisille erämaakokemus on arvokas ympäristökokemus. Ympäristön ominaisuudet sekä henkilön sosiaalinen ja kulttuurinen tausta lienevät tärkeimmät erämaakokemukseen vaikuttavat tekijät. Aikaisemmat kokemukset ja tiedot ovat tärkeä osa tätä taustaa. Henkilön sosiaalinen ja kulttuurinen tausta vaikuttavat hänen arvojensa, asenteidensa ja odotustensa muotoutumiseen. Havaittu ympäristö, henkilön sisäinen tila ja luonteenpiirteet vaikuttavat yhdessä henkilön taustan ja sen muovaamien odotusten kanssa ympäristökokemuksen laatuun ja voimakkuuteen. Henkilön kokemukset muovaavat myös henkilön erämaamielikuvaa.

Erämaakokemuksella lienee yhtymäkohtia esteettiseen kokemukseen. Esteettistä kokemista voidaan pitää välittömän kokemuksen tasona. Eettinen ja tiedollinen taso ovat muita kokemukseen vaikuttavia tasoja. Esteettinen kokemus sisältää kauneuden kokemuksen. Sen lisäksi se voi sisältää myös muita elementtejä kuten vieraantumisen kokemuksen. Myös nämä muut elementit voivat olla tärkeitä ihmiselle.

Suomalaisten erämaamielikuvan, erämaiden virkistyskäytön ja erämaaarvostusten keskeisimpien piirteiden selvittämiseksi lähetettiin 2 000 kyselylomaketta postitse satunnaisesti poimituille 18 vuotta täyttäneille suomalaisille. Maa jaettiin neljään ositteeseen ja kaikkiin lähetettiin 500 lomaketta. Lomakkeista palautettiin 44 %. Tulokset käsiteltiin kvantitatiivisesti käyttäen yleisiä tilastotieteen menetelmiä. Lisäksi selvitettiin kertomakirjallisuudessa esiintyvää erämaakuvaa analysoiden eri aikakausilta peräisin olevia subjektiivisesti valittuja teoksia kvalitatiivisesti. Kolmas aineisto kerättiin näyttämällä kuvia viidessätoista tilaisuudessa 359 henkilölle ja kysymällä heidän käsityksiään metsiköiden erämaisuudesta, maiseman kauneudesta ja metsiköiden soveltuvuudesta ulkoiluun. Lisäksi näihin tilaisuuksiin osallistuneet henkilöt täyttivät kyselylomakkeen, jossa tiedusteltiin

samankaltaisia asioita kuin postikyselyssä sekä heidän luontoon liittyviä virkistystottumuksiaan yleensä. Hahmottunutta erämaan käsitettä ja erämaiden virkistyskäyttöä verrattiin kirjallisuudesta hahmottuvaan yhdysvaltalaiseen wilderness-käsitteeseen sekä Yhdysvaltojen erämaiden virkistyskäyttöön. Lisäksi hahmotettiin suomalaisten luonnon virkistyskäyttöä ja vertailtiin sitä erämaaluonnon virkistyskäyttöön. Postikyselyyn vastaamatta jättäneistä laadittiin uusi satunnaisotos, johon kuuluvia haastateltiin puhelimitse.

Luonnontilaisuus, tiettömyys, asumattomuus, laajuus ja syrjäisyys ovat sekä yhdysvaltalaisten wilderness-alueiden että suomalaisten erämaiden tärkeitä ominaisuuksia. Metsät ja suot sekä erityisesti aarniometsät ja luonnontilaiset suot kuuluvat suomalaiseen erämaamaisemaan. Varttuneissa hoitometsissä voidaan saavuttaa merkittäviä erämaakokemuksia, mutta aarniometsissä ja luonnontilaisilla aukeahkoilla soilla kokemus on selvästi voimakkaampi. Luonnontilaiset suot ja aarniometsät lisäävät erämaisuutta alueilla, joissa hoidettujen metsien osuus on huomattava. Erityisesti kelot, puuston suuri määrä ja järeys sekä puuton korkea ikä luovat metsään erämaavaikutelmaa. Yleisesti ottaen kuusivaltaiset metsät koetaan mäntyvaltaisia erämaisempina. Taimikoita ja avohakkuualoja ei koeta erämaisina. Ihmisten erämaamielikuvat ovat melko yhteneviä.

Noin puolelle vastanneista halkaisijaltaan kahdeksan kilometrin suuruinen, luonnontilaista vanhaa metsää kasvava tietön alue on erämaa. Metsien uudistaminen vähentää erämaisuutta erittäin merkittävästi, mikäli alueen pinta-alasta uudistetaan nopeasti huomattava osa. Uudistetun tiettömän metsäalueen suuri koko ei korvaa oleellisesti erämaisuuden vähenemistä. Myös tiheähkö metsäautotieverkko vähentää erämaisuutta huomattavasti. Toisaalta intensiivisen metsätalouden alueidenkin erämaisuutta voitaneen lisätä jättämällä pienehköjä erämaisia metsiköitä ja metsäalueita sinne tänne. Rakenteista pitkospuut ja avoimet autiotuvat soveltuvat parhaiten erämaihin. Myös sellaiset vanhat suomalaiseen luontokulttuuriin kuuluvat rakenteet kuin ladot syrjäisten niittyjen laidoilla ja harmaantuneet kelokämpät soveltuvat erämaamaisemaan. Sitävastoin uudet mökit häiritsevät ihmisten erämaakokemusta. Myös rakennetut tulipaikat, opasteet ja merkityt polut soveltuvat kohtalaisesti erämaiseen ympäristöön, ainakin jos niiden määrä on kohtuullinen. Eniten erämaissa vieroksutaan lukollisia majoja, erämaakahvioita ja hiihtohissejä sekä kirjolohen istuttamista erämaavesiin.

Lappi on Suomen erämaisimpana koettu lääni. Myös Pohjois-Karjalan ja Oulun läänissä on runsaasti erämaiksi miellettäviä alueita. Kaikissa lääneissä on joitakin erämaisia alueita. Yksittäisistä alueista Urho Kekkosen kansallispuistoon suuntautuu eniten erämaakäyntejä.

Suomalaiset ovat aktiivista ulkoilukansaa suurimman osan käydessä luonnossa erityisesti viikonloppuisin varsinkin kesällä ja syksyllä. Noin puolet suomalaisista on käynyt, ja toistuvasti käy, erämaissa. Noin puolet kävijöistä

viipyy käynnillään keskimäärin korkeintaan yhden päivän ja viidesosa 1–2 vrk. Noin viisi prosenttia viettää erämaassa kerrallaan keskimäärin viikon tai enemmän.

Erämaakulttuurimme heijastunee siinä, että noin puolet vastanneista ilmoittaa tärkeimmäksi erämaatoiminnokseen marjastuksen, sienestyksen, kalastuksen tai metsästyksen. Saaliin saamisen ohella rauhan ja hiljaisuuden kokeminen on myös näiden henkilöiden tärkeä erämaakäyntien syy. Rauhan ja hiljaisuuden kokeminen on yleisesti tärkein erämaakäyntien syy. Luontoelämykset, kuten maisemien, kasvien ja eläinten näkeminen tai maastoyöpymisen kokeminen ovat myös tärkeitä syitä. Kunnon kohottaminen ja yhteisten hetkien viettäminen mainitaan myös usein. Tiedusteltaessa ihmisten luontoharrastuksia yleensä, ja niihin liittyviä motiiveja, saadaan melko samanlainen kuva kuin tiedusteltaessa erämaakäyntejä ja niihin liittyviä motiiveja. Verrattaessa suomalaisten ja yhdysvaltalaisten erämaavirkistäytymistä, havaitaan käyntien pituuksissa, motiiveissa ja aktiviteeteissa paljon yhteneväisyyksiä. Metsästys ja luonnontuotteiden kerääminen lienee Suomessa merkittävämpää kuin Yhdysvalloissa. Suomalaisten erämaamotiiveissa ei korostu yksinäisyyden tavoittelu samalla tavoin kuin Yhdysvaltalaisten motiiveissa. Toisaalta Yhdysvaltalainen yksinäisyyden käsite (solitude) on melko monitahoinen, joten ero voi olla näennäinen.

Suomalaiset arvostavat maansa erämaita. He ovat hyvin yksimielisiä siitä, että erämaita tulee säilyttää. Tärkeimpinä säilyttämisen perusteina mainitaan: 1) eliölajien suojelu, 2) säilyttäminen tuleville sukupolville ja 3) erämaiden merkitys virkistysympäristönä. Tärkeimmät erämaiden säilyttämisen syyt on havaittavissa ihmisryhmästä riippumatta ja ja kuvastuvat molempien kyselyiden tuloksissa. Hieman vajaa puolet postikyselyyn vastanneista on sitä mieltä, että maassamme on riittävästi erämaita. Hieman yli kolmasosan mielestä erämaita on liian vähän. Ainoastaan muutama prosentti vastanneista on sitä mieltä, että erämaita on liikaa. Noin puolet vastanneista toivoo lisää suojeltuja erämaita Etelä-Suomeen, Pohjois-Suomeen noin kolmannes. Vastanneista hieman alle kymmeneksen mielestä Pohjois-Suomessa on liikaa suojeltuja erämaita. Myös useimmat puhelimen välityksellä haastatellut arvostavat erämaita ja uskovat tällaisia alueita olevan Suomessa.

Vastanneet ilmoittavat matkustavansa erämaihin päästäkseen keskimäärin noin 400–1000 km vuodessa. Urho Kekkosen kansallispuisto mainitaan muita alueita useammin mieleisimpänä erämaana. Noin puolet vastanneista ilmoittaa kirjoittavansa nimensä erämaiden suojelua edistävään adressiin ja luovuttavansa rahaa erämaiden suojelua edistävään rahankeräykseen. Ilmoitetut henkilökohtaiset luovutussummat ovat melko pieniä: keskimäärin noin 30–70 mk. Noin neljäsosa vastanneista ei kirjoittaisi nimeään adressiin eikä luovuttaisi rahaa keräykseen. Noin viidesosa ei luovuttaisi rahaa, mutta ilmoittaa kirjoittavansa nimensä.



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