

Managing Forest Ecosystems

Erkki Tomppo  
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# Multi-Source National Forest Inventory

*Methods and Applications*



Springer

# Multi-Source National Forest Inventory

# Managing Forest Ecosystems

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Volume 18

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## **Aims & Scope:**

Well-managed forests and woodlands are a renewable resource, producing essential raw material with minimum waste and energy use. Rich in habitat and species diversity, forests may contribute to increased ecosystem stability. They can absorb the effects of unwanted deposition and other disturbances and protect neighbouring ecosystems by maintaining stable nutrient and energy cycles and by preventing soil degradation and erosion. They provide much-needed recreation and their continued existence contributes to stabilizing rural communities.

Forests are managed for timber production and species, habitat and process conservation. A subtle shift from *multiple-use management* to *ecosystems management* is being observed and the new ecological perspective of *multi-functional forest management* is based on the principles of ecosystem diversity, stability and elasticity, and the dynamic equilibrium of primary and secondary production.

Making full use of new technology is one of the challenges facing forest management today. Resource information must be obtained with a limited budget. This requires better timing of resource assessment activities and improved use of multiple data sources. Sound ecosystems management, like any other management activity, relies on effective forecasting and operational control.

The aim of the book series *Managing Forest Ecosystems* is to present state-of-the-art research results relating to the practice of forest management. Contributions are solicited from prominent authors. Each reference book, monograph or proceedings volume will be focused to deal with a specific context. Typical issues of the series are: resource assessment techniques, evaluating sustainability for even-aged and uneven-aged forests, multi-objective management, predicting forest development, optimizing forest management, biodiversity management and monitoring, risk assessment and economic analysis.

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Cover picture: A typical forest area in South Finland, a Scots pine (*Pinus sylvestris* L.) regeneration area in front area (Padasjoki, photo: Erkki Oksanen).

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# Preface

Statistically designed national forest inventories were developed and introduced simultaneously in the three Nordic countries, Norway, Sweden and Finland at the beginning of the 20th century. An increased interest in forests and a demand for timber were the major driving forces for national level monitoring. The utilisation of forests has been of a vital importance to the national economies in these countries, and especially in Finland and Sweden.

Rapid changes in forests since the 1970s and in the 1980s and the continued importance of the forest sector in the Finnish economy stimulated further development of the inventory methodology, as well as the need to cheaply obtain forest resource information for areas smaller than would be possible using only field data. Natural resource satellite images had enabled to enhance inventories at relatively small additional costs. The development of the multi-source inventory (MS-NFI) method that utilises satellite images, field data and digital map data began in 1989, and the first operative results were calculated in 1990.

Methods were sought to achieve estimates for small areas that were as good as the field data-based estimates at national and regional levels. To meet these requirements and to avoid the drawbacks of the classical image classification methods, a *k*-Nearest Neighbour estimation method (*k*-NN) was developed. A somewhat similar *k*-NN classification method had earlier been employed in image analysis and pattern recognition applications. In addition to the small area estimates, the MS-NFI provides predictions of forest variables in map form.

Following the Finnish example, similar development work is being carried out in a few other countries. The method has been modified continuously and new features have been added since its first implementation. The multi-source forest inventory methods developed and employed in the connection of the ninth National Forest Inventory of Finland are presented in this book, in addition to the full set of the results. The latest development in error estimation is also briefly discussed. The book aims to help the reader to understand the possibilities of the *k*-NN methods

and the strengths of the multi-source inventory; and to employ the methods in diverse environment and natural resource monitoring tasks, and with many types of remote sensing data.

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The development of multi-source forest inventory was initiated by late professor Pekka Kilkki at the Finnish Forest Research Institute, Metla. The results presented in this book presume the availability of forest inventory field data, amounting to about 150,000 field plots in two inventories, NFI8 and NFI9, as well as functioning computing and data management facilities, all provided by Metla. The manuscript has been read and valuable improvements suggested by Dr. Juha Heikkinen and Mr. Kai Mäkisara. The language was edited by Dr. Ashley Selby, and final editing was made by Ms. Sari Elomaa, Maija Heino and Reija Mikkola. We are deeply indebted to all the individuals whose support has made this book possible. We also express our sincere thanks to Dr. Catherine Cotton, Publishing Editor, and Ms. Ria Kanters at Springer for their guidance and assistance during all the phases of the production of the book.



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# List of Abbreviations

k-NN	k-Nearest Neighbour method
ik-NN	Improved k-NN method
NFI	National forest inventory
MS-NFI	Multi-source national forest inventory
Landsat	Land satellite
Landsat MSS	Multispectral Scanner
Landsat TM	Thematic Mapper, a high-resolution scanner system on board the Landsat-4 and Landsat-5 satellites
Landsat ETM+ Spot XS HRV	Enhanced Thematic Mapper, sensor on-board Landsat-7 Satellite pour l'Observation de la Terre with XS (Spot 2) or XI (Spot I) multispectral scanner, High resolution Visible (HRV) imaging systems
SLC	Scan Line Corrector, compensates for forward motion of Landsat satellite
IRS-1 C/D LISS-III	Indian Remote Sensing Satellite, Linear imaging self-scanner 3
IFOV	Instantaneous field of view, when expressed in linear or area units such as meters or hectares, it is an altitude dependent measure of the ground resolution of the scanner
NLS	National Land Survey of Finland
TOPO50	1:50,000 topographic map database
TOPO	Topographic database
PerusCD	Digital map corresponding to 1:20,000 printed maps
DEM	Digital elevation model
RMSE	Root mean square error
SE	Standard error
FRYL	Forestry land, in MS-NFI covers forest land, poorly productive forest land and unproductive forest land
FPFF	Forest and poorly productive forest land
PPF	Poorly productive forest land

# Chapter 1

## Introduction

**Abstract** This book presents the Finnish multi-source forest inventory method (MS-NFI) that was developed and applied in connection with the ninth National Forest Inventory of Finland (NFI9). The book also presents a complete set of results. The purpose is to demonstrate both the use of the method and the results in a concrete way for forestry and other applications. The aim is to help the reader in a possible implementation of the method. The method employs satellite images, digital map data and other ancillary data, e.g., predicted coarse scale variations of forest variables, in addition to field data. It produces both small-area estimates of forest parameters, as well as predictions of variables in map form. The first chapter outlines the background of the Finnish national forest inventories and the Finnish multi-source inventories (MS-NFI). Some basic principles of the MS-NFI are explained together with examples of the use of the results. Satellite image-based inventories in other countries are briefly reviewed.

**Keywords** Multi-source forest inventory, national forest inventory, satellite images

The first National Forest Inventory (NFI) was carried out in Finland in 1921–1924. The tenth rotation began in 2004 and will be completed by 2008. The increased interest in forests and the demand for timber were major driving forces for national level monitoring. The information from the inventories has traditionally been used in large area forest management planning, strategic planning by forest industry companies, for forest income taxation, and as the information basis of forest and environment policy. The information is also increasingly used in the reporting to international conventions and agreements. The sampling designs and plot- and stand-level measurements have been changed over time to respond to changing requirements and to optimize the use of available resources.

The sampling design in the first inventory was a line-wise survey sampling (Ilvessalo 1927). Similar sampling systems, with different sampling intensities, were employed during the next three inventories until 1963. Since then, detached tracts (clusters of sample plots) have been employed (Kuusela and Salminen 1969). A new feature introduced in the 1960s and 1970s for the sixth and seventh

inventories for northern Finland was the use of aerial photographs with a grouping method: a variation of double sampling for stratification (Poso 1972).

Based on the information from sample plots, estimates can be made for a country, or regions within a country, with a minimum size of about 300,000–500,000 ha. The densities of plots are high enough to ensure that the resulting sampling errors are low for core variables such as areas of land classes and the volume of growing stock. For example, the standard error of the estimated volume of the growing stock in a Forestry Centre, with an area of 0.8–5.0 million hectares, was in NFI8 around 2% in Finland, and at the national level it was 0.6% (Tomppo et al. 2001b).

The administrative units in Finnish forestry are the forestry centres, which have forest areas between 800,000 and 5 million hectares. However, the areas of the centres are divided into sub-areas, or forest management units for which forest resource and forest status information are needed. The changed practices of the forest industries, increased public awareness about forests, as well as increased changes in the forests during the 1980s required more accurately localised and up-to-date information than earlier. The use of field data alone to respond to the increased information needs would have been an expensive alternative. Either a substantially denser field plot grid or some other type of information was required.

The first tests with space-borne remote sensing for forest inventory purposes were made in Finland in late 1960s and early 1970s (Kuusela and Poso 1970). The Earliest images were from a weather satellite, and then images of Landsat multi-spectral channel (MSS), and from the 1980s, Landsat Thematic Mapper (TM) and Spot XS images were tested at universities and research institutes. A list of publications is given in Tomppo (2006b).

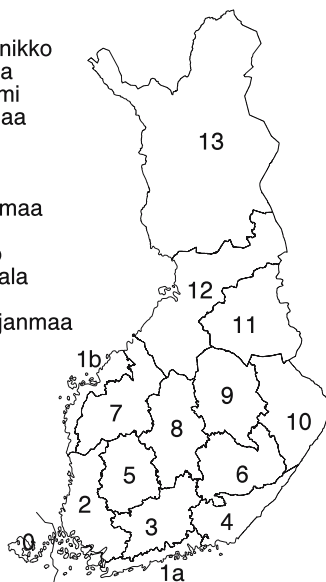
The development of the Finnish multi-source national forest inventory (MS-NFI) began in 1989, and the first operative results were calculated in 1990 (Tomppo 1990, 1991, 1996, 2006b). The driving force behind the development was the need to obtain forest resource information, at a low cost, for areas smaller than possible when using only field data. Furthermore, new natural resource satellite images provided possibilities for increasing the efficiency of inventories at relatively small additional costs. MS-NFI was introduced during the eighth rotation of NFI (1986–1994) in the Pohjois-Savo forestry centre (Fig. 1.1) (Tomppo et al. 1998b).

MS-NFI progressed from Central Finland towards North Finland in the connection of the field NFI. For southernmost Finland, inventoried before the launch of MS-NFI, i.e., in 1986–1988, MS-NFI was made as follows. A sub-sample of the field plots in southernmost Finland was re-measured in 1994. The sampling ratio was a little less than 40% of the plots. MS-NFI estimates were calculated using the re-measured field data and satellite images from 1994, or the closest to that year if the 1994 image was not available for some sub-region. The inventory is sometimes called NFI8+ and the corresponding multi-source inventory MS-NFI8+ (Tomppo et al. 1998b). The term MS-NFI8 is, however, used throughout this book.

In contrast to previous methods of satellite image classification, methods were sought that would be able to provide area and volume estimates, possibly broken down into subclasses, such as tree species, timber assortments, and stand-age classes. The potential wood energy biomass of forests was also considered in this

Forestry centre

- 0 Åland
- 1 Rannikko
  - 1a Etelä-Rannikko
  - 1b Pohjanmaa
- 2 Lounais-Suomi
- 3 Häme-Uusimaa
- 4 Kymi
- 5 Pirkanmaa
- 6 Etelä-Savo
- 7 Etelä-Pohjanmaa
- 8 Keski-Suomi
- 9 Pohjois-Savo
- 10 Pohjois-Karjala
- 11 Kainuu
- 12 Pohjois-Pohjanmaa
- 13 Lapland



**Fig. 1.1** Forestry centres 1.1.2007. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

book due to its importance as an alternative energy source to non-renewable energy. In the optimal case, the method should be able to provide estimates for small areas equally as good as the field based method provides estimates at national and regional levels. In the first satellite image experiments aimed at forest management inventory, regression- and discriminant analysis methods were tested (Tomppo 1988). In these approaches, the areal estimates of the parameters and the pixel level predictions of the values of the variables had to be made separately (or in small groups). The main experiences were that (i) it was difficult to obtain a sufficient degree of detail in the information and (ii) the dependence structure of the variables generally was lost when the predictions of different variables were made independently. To avoid these drawbacks, a new method for multi-source inventory was developed. It utilises *k*-Nearest Neighbour estimation and has become known as the *k*-Nearest Neighbour method (*k*-NN) (Linton and Härdle 1998; Tomppo 1990). Since the first implementation of this method, it has been modified continuously and new features have been added (Katila et al. 2000; Katila and Tomppo 2001, 2002). The core of the current Finnish method is presented in Tomppo and Halme (2004). In that paper, a method called *ik*-NN, an improved *k*-NN method, was introduced. Any digital land use map or land cover data can be used to improve the

accuracy of the predictions (Tomppo 1991, 1996). The list of references of k-NN applications and tests in forest inventories are given in Tomppo (2006b). New features in k-NN methods are discussed in Subsection 3.2.3.

A somewhat similar method has been developed in Sweden. The main features of the Swedish k-NN algorithms and products are given in Reese et al. (2002, 2003). The development work is also described by Nilsson (1997) and Hagner and Olsson (2004). The k-NN product is the only nationwide complete coverage forest database in Sweden and it is used for a multitude of purposes. However, it will only be utilized in the official Swedish statistics as a basis for post-stratification, see also Tomppo et al. (2008).

Currently, scientists from the USDA Forest Service and from Universities in the USA are also developing the multi-source methods (Franco-Lopez et al. 2001; McRoberts 2006; McRoberts et al. 2002a, 2002b, 2006). McRoberts et al. (2002a, 2002b) applied a post-stratified volume and forest area estimator where the stratification was based on k-NN predictions. This is one promising way to derive statistically sound estimates and error estimates. Other developments include work by McRoberts (2006) and McRoberts et al. (2007), who presented a model-based approach to derive k-NN error estimates for a group of pixels at an arbitrary size, and Finley et al. (2006) and Finley and McRoberts (2008), who presented two methods to increase the efficiency of the k-NN search.

Similar multi-source methods have also been tested for limited areas in several other countries, such as Norway (Gjertsen 2005), Austria (Koukal et al. 2005), New Zealand (Tomppo et al. 1999), China (Tomppo et al. 2001a), Germany (Diemer et al. 2000) and Italy (Maselli et al. 2005).

The objective of this book is to present the method and the municipality-level results of the ninth multi-source national forest inventory of Finland (MS-NFI9). All phases of the process and input data sets are presented. A set of the result tables is presented to demonstrate the possibilities for making estimates. These result tables are also important for comparisons between MS-NFI8 and MS-NFI9 estimates and to understand the limitations of the method. Furthermore, the results and accuracies of the MS-NFI estimates are discussed and some comparisons with the results of MS-NFI8 are made.



## Chapter 2

# Materials

**Abstract** The field sample of the ninth National Forest Inventory (NFI9) was measured from systematically located clusters of sample plots. The NFI9 sampling designs, cluster sizes and distances between clusters varied from  $6 \times 6$  km in southernmost Finland to  $10 \times 10$  km in Lapland. In total, 67,264 field plots were measured on forestry land across the entire country. Stand level characteristics and tree level measurements were recorded from the field sample plots. In the MS-NFI, tree-level volumes were transformed to volumes per hectare using the basal area factor and the maximum radius of the plot. Images from Landsat 5 TM or Landsat 7 ETM+ sensors were the most suitable for the MS-NFI by virtue of the fairly large coverage area of each image. In total, 42 Landsat 5 TM or Landsat 7 ETM+ images and 6 IRS-1 C or D LISS-III images were used to cover the land area of Finland. Map information was used to separate forestry land from other land classes. Map data were also used to stratify the forestry land area and the corresponding field plots into a mineral soil stratum and a peatland soil stratum. The majority of the map data came from the topographic database of the National Land Survey but in some areas this map data had to be combined with separate, older map data. The accuracy of the MS-NFI9 land use map data was estimated using a confusion matrix between the map and field based land classes of the NFI field plot data. The percentage of correctly classified land classes was 92.2% and 96.3% for South Finland and North Finland, respectively. Digital municipal boundaries were used to delineate the basic computation units in the MS-NFI. A digital elevation model was used in two ways, for stratification on the basis of elevation data and for radiometric correction. Coarse scale digital forest variable maps were constructed to guide the selection of the nearest neighbours.

**Keywords** National forest inventory data, satellite images, numerical map data

## 2.1 Field Data

### 2.1.1 Sampling Designs

The Finnish national forest inventory is a sampling based inventory. The sample plots are arranged into clusters that are also referred to as tracts. An important aspect is that the cluster should represent one day's average work. The field measurements and assessments of the NFI are carried out on the field sample plots and on those forest stands that include at least a part of a field plot. The field sample plot is also a unit in the field data based estimation (Tomppo 2006a). The ninth inventory rotation was conducted during the years 1996–2003: the field work proceeded by forestry centres (Fig. 1.1).

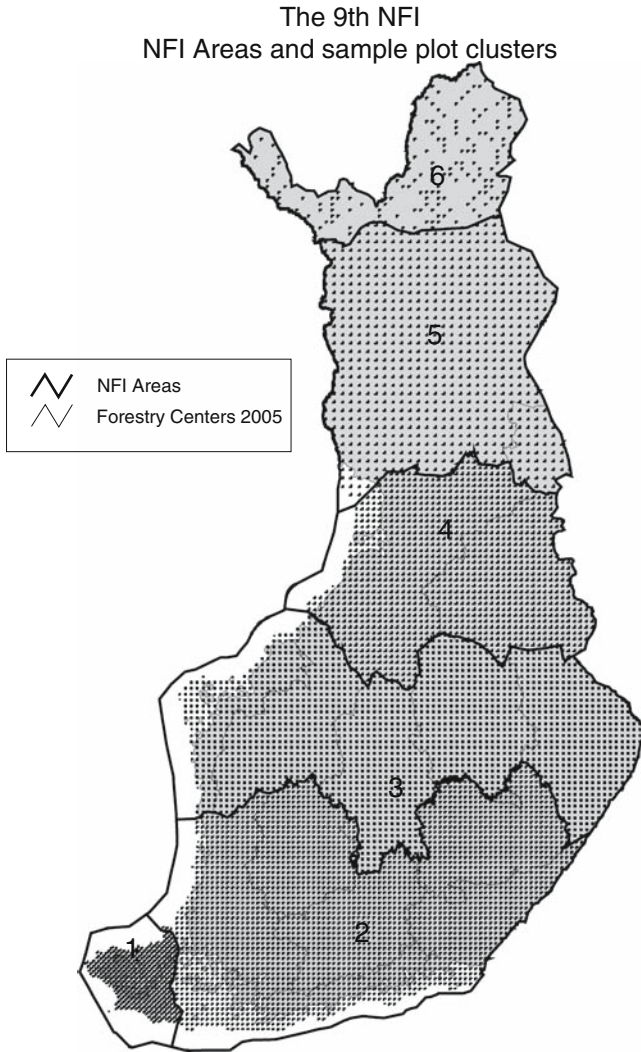
The sampling design was adapted to the variability of the forests. The six sampling density regions, together with field plot clusters, are shown in Fig. 2.1. The NFI9 sampling designs, cluster sizes, and distances between clusters, in the southernmost part of the country, Central Finland, North Central Finland, South Lapland, and North Lapland are shown in Fig. 2.2. The distances between clusters were  $6 \times 6$  km in the southernmost Finland (extra cluster lines were added to obtain high enough number of field plots in Åland, Region 1, Fig. 2.2a),  $7 \times 7$  km in Central Finland,  $7 \times 7$  km elsewhere in North Central Finland, with fewer plots than in Central Finland, and  $10 \times 10$  km in the municipality of Kuusamo and in South Lapland except in the area of the three northernmost municipalities.

Two-phase stratified sampling was applied in three northernmost municipalities. The stratification was based on three variables: (1) the proportion of waste land (e.g. open bogs and very poor mineral sites like open rocks), (2) the volume of growing stock and (3) the predicted cumulative day-time temperature. The two first variables were predictions of multi-source forest inventory in a form of thematic maps (Henttonen 1991; Tomppo 2006a).

Satellite image-based digital volume maps and sampling simulations were employed to evaluate different sampling designs. The sampling intensity was fitted to the spatial variation in forests throughout the whole country, being lower in the north than in the south (Henttonen 1991).

### 2.1.2 Measurements and Assessments on Field Sample Plots and Plot Stands

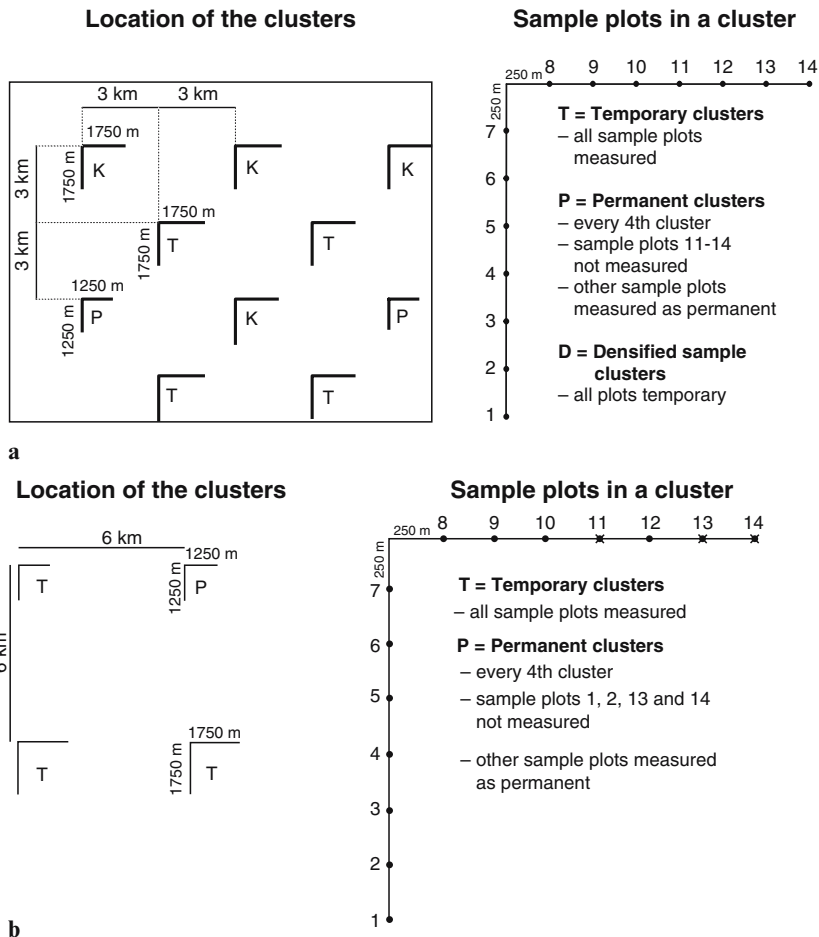
The measured quantities of NFI are called either characteristics or variables. The stands including at least a part of a field sample plot are here called field plot stands. Some stand level characteristics concerning the growing stock are assessed or measured by crown layer classes. The stand characteristics are used for area estimation in the field data based estimation and to stratify the inventory region into the calculation strata for area, volume and volume increment estimation. All volume



**Fig. 2.1** NFI9 layout of clusters and the six geographic regions with different sampling densities, 1996–2003.

and volume increment estimates of the growing stock are derived from the tree measurements carried out on the field sample plots. Models are applied in the volume estimation. The experiences from the preceding inventories were applied in designing the field measurements of NFI9. Some new characteristics were introduced in NFI9, particularly characteristics related to forest biodiversity.

In the Finnish NFI schema, forestry land is divided into productive forest land, poorly productive forest land, unproductive forest land (also called waste land) and the land class consisting of forest roads, forest depots and camp lots, small gravel



**Fig. 2.2** The NFI9 sampling design in different inventory regions: (a) region 1, (b) region 2, (c) region 3, (d) region 4 (in region 5, the design is same but the distances are 10 × 10km, (e) region 6. Stratified sampling was used in region 6.

pits etc. (Tomppo et al. 1997). Forestry land in the MS-NFI includes forest land, poorly productive forest land and unproductive forest land (land classes 1 to 3), not land class 4, forestry roads etc. which belong to built-up land in MS-NFI. Note that the national definitions of both forest land and poorly productive forest land deviate from the definitions of forest land and other wooded land of the FAO (2001), although the FAO definitions were employed together with the national definitions in the NFI9.

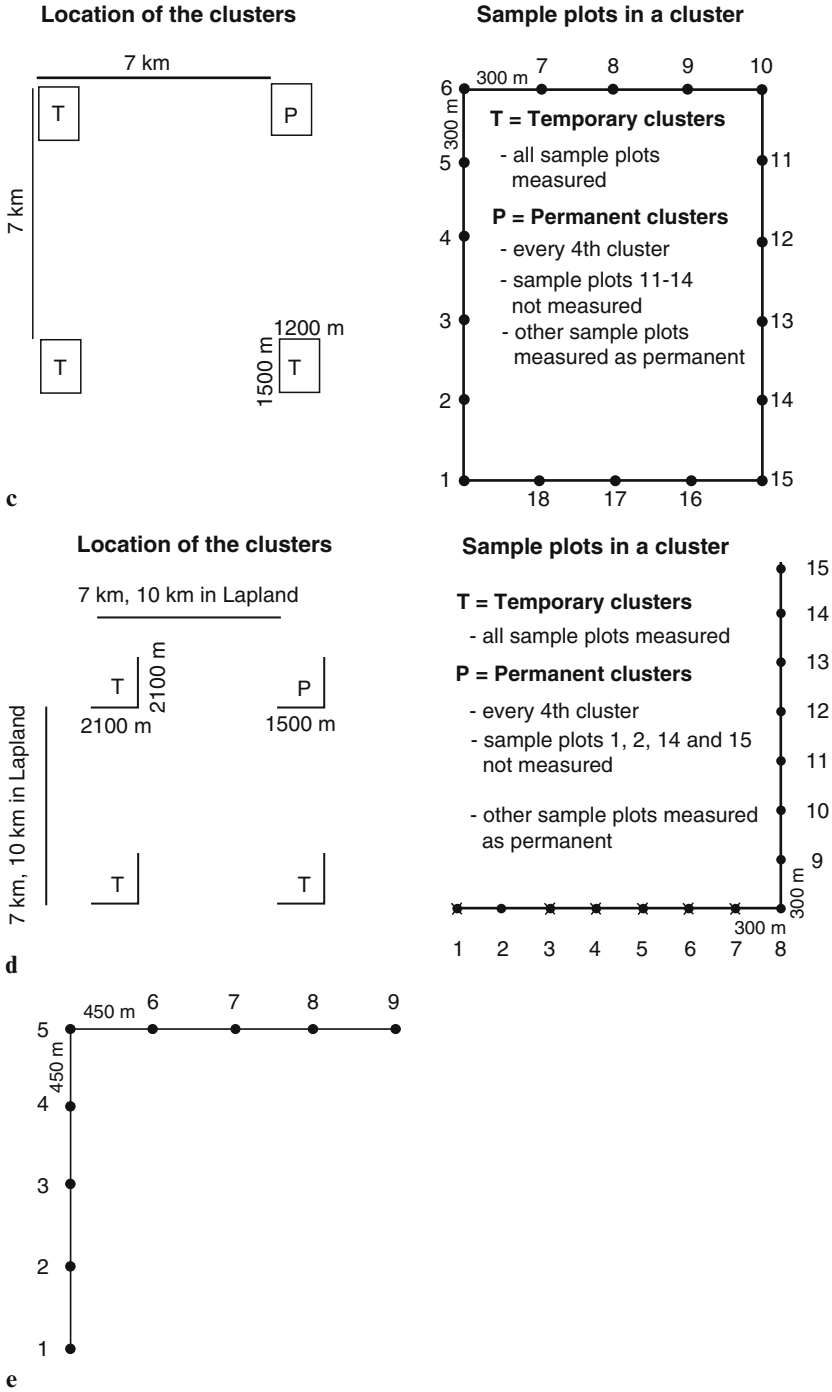


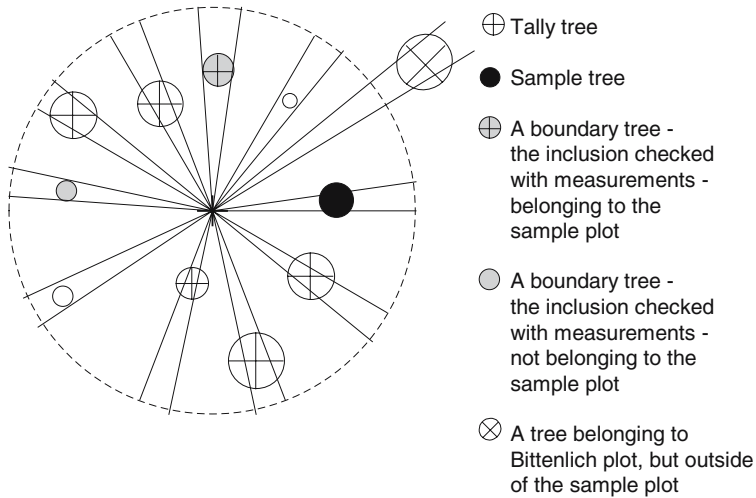
Fig. 2.2 (continued)

Stand level data can be classified into the following groups:

1. General data of field plot cluster, e.g., inventory type, record type, crew leader, coordinates of cluster, date, inventory area
2. Plot identification data, e.g., plot number, coordinates, administration, possible restrictions in wood production, multiple use, plot size, etc.
3. Site data, e.g. land class and its changes, direction and distance to the closest stand boundary (used in selecting field plots to feature estimation in ik-NN analysis), the features for main site fertility type, mixture of site fertility types, specification of mire type, soil type, quality and thickness of organic layer, drainage accomplished and proposed, forest income taxation class, etc.
4. Information by crown layer, e.g. species in the layer, development class, stand establishment, dominant tree species, species mixture, number of stems, quality, mean diameter, mean height, age, syndrome, originating time and cause of damage
5. Other stand level information, e.g., seriousness of damages (all layers simultaneously), lichen survey, stand quality, accomplished as well as proposed silvicultural and cutting regimes and time, basal area
6. Key biotopes within a circular sample plot with a radius of 30 m

Five concentric plots were applied in NFI9. The radius of the plot depended on the variable in question and on the value of the variable, e.g. the radius of the tally tree plot depends on the diameter of a tree. From plot level data, only data from tally tree plot were employed in MS-NFI9. It is a Bitterlich plot (angle-gauge plot) measured on forest and poorly productive forest land (FPPF). A tree with a diameter of  $d$  is thus measured on a circle with a radius of  $r = 50d/\sqrt{q}$ . The basal area factor  $q$  was 2 in southern Finland (regions 1–3) and 1.5 in northern Finland (regions 4–6). The maximum radius was 12.52 m and 12.45 m, respectively (corresponding to breast height diameters of 34.5 cm and 30.5 cm, respectively). Where a relascope could not be used for judging inclusion reliably, this was checked by measuring the distance and diameter of the tree at a height of 1.3 m. Reducing the radius of a sample plot detracts very little from the reliability of the estimates, but it does ease the amount of fieldwork noticeably in some cases, as the number of divided sample plots (i.e., sample plots belonging to two or more stands or land classes) decreases. The use of maximum distance may also reduce errors caused by possible unobserved trees, usually located a long distance from the plot centre and behind other trees. Every seventh tally tree is measured as a sample tree, except in the area of the three northernmost municipalities where it is every fifth, see Fig. 2.3.

A stand including a centre point of a sample plot is called *centre-point stand*. A stand including a part of the field plot (trees of a plot) but not a centre point of a plot is called a *sub-plot stand*. The corresponding terms for plot parts are *centre-point plot* and *sub-plot*. The characteristics to be assessed or measured on a stand depend on the land class in question. All variables to be recorded from the land class in question are recorded from a centre point stand independently of whether trees are measured on the plot or not. Only a few variables are recorded from a sub-plot stand if there are no tally trees in the corresponding plot. The reason for this is



**Fig. 2.3** A sample plot of NFI9. The maximum distance to trees to be counted is 12.52 m in South Finland ( $q = 2$ ) and 12.45 m in North Finland ( $q = 1.5$ ). Every seventh tree is measured as a sample tree, counted by crews and starting in the beginning of field season.

that the area estimates are based on the information on the centre point stands only in the field inventory based estimation. Note that the tally trees on both centre-point plots and sub-plots are applied in volume and volume increment estimation (Tomppo 2006a).

The main idea in employing multi-source data is to estimate new area weights for field sample plots. Furthermore, digital thematic maps can be created, in principle for any arbitrary variable in the NFI.

One record is made for each centre-point plot and each sub-plot. The record consists of field data, satellite image data, digital map data and coarse scale forest variable data. Field data consists of site and stand variables, as well as field plot level data, and are attached to the pixel whose centre point is nearest to the centre point of a plot. The satellite image data and digital map data are same for a centre-point plot and a possible associated sub-plot.

The basic computation unit in image processing is a picture element, a pixel. The pixel size employed in the MS-NFI was  $25 \times 25$  m. All field data variables are assumed to correspond to an area of this size.

The tree-level volumes are transformed to volumes per hectare in the MS-NFI using the basal area factor and the maximum radius of the plot. Volumes per hectare are estimated for each sample plot by tree species and by timber assortment classes based on the tally tree volumes. The estimation of volumes and volumes of timber assortments for tally trees from field measurements is described in Tomppo (2006a). Otherwise, the field variables used are similar to those in the NFI calculations that use field data only. The only exception was the prediction of stand height using the tree level models by Veltheim (1987). These models

were applied only with the data from South and Central Finland. The stand height has been measured in the field since 2001 in NFI9 in North Finland. As the calculations based on field measurements do not involve increment estimates for tally trees, increment estimates are not usually produced using the multi-source method. The main principles of the Finnish NFI using field data only are given in Subsection 3.2.1.

Biomass estimates were calculated for each field plot for energy wood estimation. The two main potential development classes of wood energy sources of forests in Finland are young thinning stands and mature stands. All tree compartments above stump of those trees to be harvested as an energy wood are removed in a young thinning stand, i.e., the entire stem over stump, branches and foliage. Only the residual part of stem, in addition to branches, foliage, and optionally stumps and coarse roots (with a theoretical minimum diameter of 2 cm) are removed for energy in the case of the regeneration cutting of a mature stand.

Only sample trees were employed in the biomass estimation because tree variables were required for predicting the biomass of tree compartments. It was decided not to predict the variables for tally trees. The sampling ratio of the sample trees was naturally taken into account in estimation. Every seventh tally tree was measured as a sample tree. Therefore the basal area factor for sample tree is close to 14 in southern Finland and close to 10.5 in northern Finland, except in the area of the three most northern municipalities where it is close to 7.5 ( $5 \times 1.5$ ), see above. The exact basal area factor depends on the ratio 'number of tally trees/number of sample trees', in addition to basal area factor of the tally trees.

The cutting residual part of a stem was obtained by subtracting the potential saw timber volume and pulp wood volume from the entire stem volume. All volumes were predicted using volume functions and timber curve models (Laasasenaho 1982) as described in Tomppo (2006a). Biomass estimates for tree compartments were predicted for trees on FPPF of NFI9 using tree level biomass models (Marklund 1988) (Table 2.1). Tree level biomass predictions were converted to kg/ha taking into account angle-gauge sampling (Bitterlich sampling), basal area factor and the maximum radius of the plot. Thus, biomass predictions were obtained for each plot and plot part on FPPF.

**Table 2.1** The compartments of tree biomass (Marklund 1988).

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Stem
Bark
Living branches
Foliage
Dead branches
Stump
Large roots, minimum diameter 2 cm
Small roots
Stem residual (from timber assortment class proportions and stem and bark biomass)

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## 2.2 Satellite Images

### 2.2.1 *The Applied Satellite Images*

Images from the Landsat 5 TM or Landsat 7 ETM+ sensors were the most suitable for operative applications by virtue of the fairly large coverage area of each image combined with moderate spatial and spectral resolution. The problems with Scan Line Corrector (SLC) appeared in the ETM+ sensor on May 31, 2003, which made it unsuitable for MS-NFI. These images were given priority when choosing satellite images to cover an inventory area. IRS-1 C and D LISS-III images were used in NFI9 if Landsat TM or ETM+ images were not available, e.g. due to clouds.

The land area of Finland is 30.45 million hectares, and the total area together with lakes and rivers is 33.81 million hectares. This was covered for NFI9 (1996–2003) with 42 Landsat 5 TM or Landsat 7 ETM+ images and 6 IRS-1 C or D LISS-III images (Table 2.2, Fig. 2.4). For MS-NFI8 36 Landsat 5 TM images and 6 Spot 2 XS HRV images were employed. Note that the field data was from the years 1990–1994 over the entire country due to the fact that a sample of the original data in South Finland from the years 1986–1999 was re-measured in 1994 (Tomppo and Henttonen 1996; Tomppo et al. 1998b).

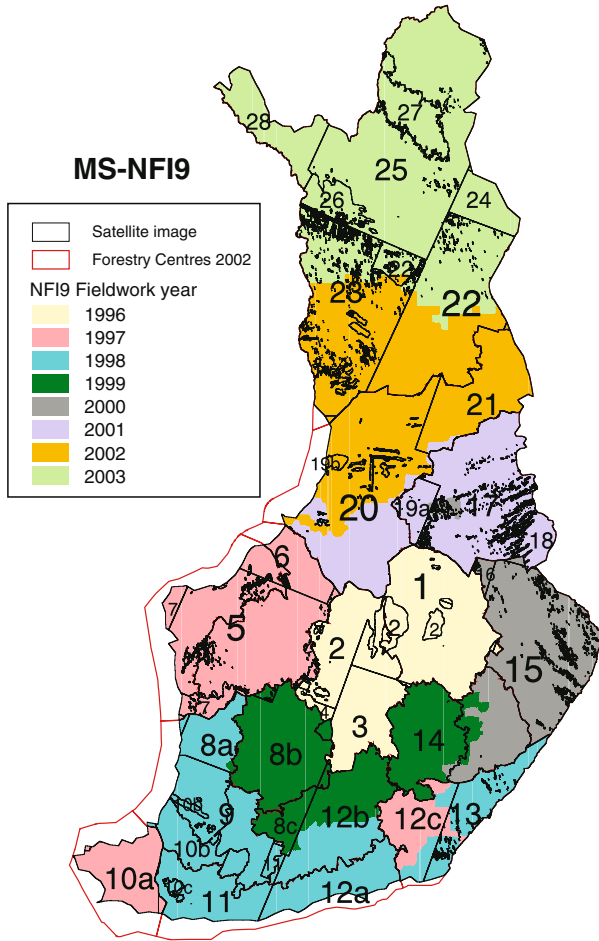
The goal in image acquisition was to obtain the images for each inventory region from the year in which the field measurements had been carried out. A suitable imaging season in Finland is from mid-May until the end of August with the optimal time from early June until the end of July (e.g., Peterson 1989). The imaging season is rather short and cloud cover is frequent even in the summer. The image acquisition is therefore problematic and it is usual that the satellite images can not be obtained from the same year as the field measurements have been carried out (Table 2.2).

Some basic concepts concerning satellite images are first recalled. *Radiance* refers to the flux of energy per unit solid angle leaving a unit surface area in a radial direction per unit time. Radiance corresponds to brightness in a given direction toward the sensor, and is different from *reflectance*, which is the ratio of reflected versus total energy. Radiance is what is measured at the sensor and is somewhat dependent on reflectance (Manual of Remote Sensing 1983; USGS 2007).

Spatial resolution is a complex concept, though it is often presented in an elementary way. In the simplest case, spatial resolution may be defined as the minimum distance between two objects that a sensor can record distinctly. The Manual of Remote Sensing (1983) gives the following description: *Spatial resolution* in terms of the *geometric properties of the imaging system*, is usually described as the instantaneous field of view (IFOV). IFOV is a function of satellite orbital altitude, detector size, and the sensor altitude. Depending on the sensor and imaging type, and also due to curvature form of the earth, the IFOV may vary slightly from the centre of the image to the boundary areas from one place of the image to another ETM+ has an IFOV of 30 m for bands 1–5, and 7, 60 m for band 6, and 15 m for band 8, while the SPOT panchromatic sensor has an IFOV of 10 m, the SPOT multispectral (XS) sensor has an IFOV of 20 m, and the Indian Remote Sensing Satellite (IRS) has an IFOV of 36.25 m.

**Table 2.2** List of satellite images used in the MS-NFI9: image index number in Fig. 2.4, satellite sensor, path/row, image acquisition date, year of NFI field work and the forestry centres (Fig. 1.1) covered by the image.

Image no. (Fig. 2.4)	Sensor	Path/row	Date	Year of NFI field work in image area	Forestry centres covered
1	Landsat 5 TM	188/16	24.8.1996	1996	9,8
2	Landsat 5 TM	189/16	31.8.1996	1996, 1997	9,8
3	Landsat 5 TM	188/17	24.8.1996	1996	9,8
4	Landsat 5 TM	189/17	9.7.1994	1996, 1997, 1986, 1987, 1988	8
5	Landsat 5 TM	191/16	13.6.1997	1997	7,1b
6	Irs 1C	30/21	17.6.1997	1997, 1996	7,1b
7	Landsat 5 TM	192/16	4.6.1997	1997, 1998	7,1b
8a	Landsat 5 TM	190/16,17	12.6.1999	1999, 1998	2
8b	Landsat 5 TM	190/16,17	12.6.1999	1999, 1998, 1997, 1996	5
8c	Landsat 5 TM	190/16,17	12.6.1999	1999, 1998	3
9	Landsat 5 TM	190/18	28.6.1999	1998, 1999	2
10a	Landsat 5 TM	191/18	16.8.1997	1997	0
10b	Landsat 5 TM	191/18	16.8.1997	1997, 1998	2
10c	Landsat 5 TM	191/18	16.8.1997	1998, 1997	1a
11a	Landsat 5 TM	190/18	30.7.1999	1998, 1999	1a
11b	Landsat 5 TM	190/18	30.7.1999	1998, 1999	2
12a	Landsat 5 TM	188/17,18	8.6.1997	1998, 1997, 1999	1a
12b	Landsat 5 TM	188/17,18	8.6.1997	1998, 1999, 1997	3
12c	Landsat 5 TM	188/17,18	8.6.1997	1997, 1998, 1999, 2000, 1996	4
13	Landsat 7 ETM+	186/17,18	3.8.1999	1998, 1997, 1999, 2000, 1996	4
14	Landsat 7 ETM+	187/17	2.8.1999	1999, 2000	6
15	Landsat 7 ETM+	186/16,17	10.6.2000	2000, 1999	10,6
16	Landsat 7 ETM+	187/16	2.8.1999	2000	10
17	Landsat 7 ETM+	188/14,15	26.7.2000	2001, 2000	11
18	Landsat 7 ETM+	186/15	28.7.2000	2001, 2000	11
19a	Landsat 7 ETM+	190/15	27.5.2002	2001, 2000	11
19b	Landsat 7 ETM+	190/15	27.5.2002	2002, 2001, 2000	12
20	Landsat 7 ETM+	190/14,15	30.7.2002	2002, 2001, 2000	12
21	Landsat 7 ETM+	188/14	29.5.2002	2002, 2001	12
22	Landsat 7 ETM+	190/13,14	30.7.2002	2002, 2003, 2001	13
23	Landsat 7 ETM+	192/13,14	29.8.2002	2002, 2003	13
24	Landsat 7 ETM+	189/13	21.8.2001	2003, 2002	13
25	Landsat 7 ETM+	192/11,12	13.8.2002	2003	13
26	Landsat 7 ETM+	193/12,13	1.6.2002	2003, 2002	13
27	Landsat 7 ETM+	192/11	26.8.2001	2003	13
28	Landsat 7 ETM+	195/11	27.7.2000	2003	13
<b>Images for small patches</b>					
	Irs 1D	30/20	22.8.2001		
	Irs 1D	33/20,21	24.6.2001		
	Irs 1C	36/23,24	13.6.1999		
	Landsat 5 TM	186/16	27.5.1992		
	Landsat 5 TM	187/15	12.8.1994		
	Landsat 5 TM	188/16	2.7.1994		
	Landsat 7 ETM+	185/16	4.8.1999		
	Landsat 7 ETM+	189/15	2.6.2001		



**Fig. 2.4** The satellite image mosaic used to cover Finland in MS-NFI9. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

### 2.2.2 Landsat 5 TM

The Thematic Mapper (TM) is a multispectral scanning radiometer on board Landsat 4 and 5. The TM sensors have provided nearly continuous coverage from July 1982 to present, with a 16-day repeat cycle. Landsat 5 was launched on March 1, 1984. The Landsat 5 TM sensor is a multispectral scanning, earth resources instrument designed to achieve higher image resolution, sharper spectral separation, improved geometric fidelity, and greater radiometric accuracy and resolution than the MSS sensor (USGS 2007).

TM data are scanned simultaneously in seven spectral bands. Band 6 scans thermal (heat) infrared radiation. Bands 1–5 and 7 have a spatial resolution of 30 m. The spatial resolution for the thermal infrared (band 6) during image acquisition is 120 m, but the delivered TM band 6 is re-sampled to 30 m pixel size. The flight altitude of Landsat 5 is 705 km and the TM scene size is 170 × 183 km (Table 2.3).

The thermal band (band 6) has not been used in the MS-NFI due to its poor spatial resolution and the high variation of Finnish forests. A specific area is covered more frequently at higher latitudes due to an increasing overlap of the adjacent paths. North of 54 degrees, the overlap is equal to or higher than 50% (USGS 2007).

Landsat TM images are available with three different levels of correction, systematic correction (for general public), precision correction and terrain correction. Images with systematic correction have been ordered for Finnish MS-NFI purposes. The correction includes both radiometric and geometric correction.

Landsat 5 TM data acquired after 1988 were found to have linearly increasing radiometric errors due to changing lamp response. In addition, a separate error appears to have been introduced into the processing of scenes acquired between 2000 and 2002. These radiometric errors only affect the reflective bands. These errors might have a minor impact on the differences between MS-NFI8 and MS-NFI9 estimates.

### 2.2.3 Landsat 7 ETM

Landsat 7’s sensor – the Enhanced Thematic Mapper Plus (ETM+) is a derivative of the Thematic Mapper (TM) of Landsats 4 and 5, but it is more closely related to

**Table 2.3** The technical properties of Landsat 5 Thematic Mapper.

Band	1	2	3	4	5	6	7
Bandwidth (µm)	0.45– 0.52	0.52– 0.60	0.63– 0.69	0.76– 0.90	1.55– 1.75	10.42– 12.50	2.08– 2.35
Spatial resolution (m)	30	30	30	30	30	120	30
Scene size (km <sup>2</sup> )	183 × 172						
Repetition (days)	16 at the Equator, 8 at the latitudes +60 and –60						

**Table 2.4** The technical properties of Landsat 7 the Enhanced Thematic Mapper Plus (ETM+).

Band	1	2	3	4	5	6	7	8 (Pan)
Bandwidth (µm)	0.45– 0.52	0.53– 0.61	0.63– 0.69	0.78– 0.90	1.55– 1.75	10.42– 12.50	2.09– 2.35	0.52– 0.90
Spatial resolution (m)	30	30	30	30	30	60	30	15
Scene size (km <sup>2</sup> )	183 × 172							
Repetition (days)	16 at the Equator, 8 at the latitudes +60 and –60							

the Enhanced Thematic Mapper (ETM) lost during the Landsat 6 failure. The primary performance-related changes of the ETM+ over the TM's are the addition of the panchromatic band and two gain ranges, the improved spatial resolution for the thermal band, and the addition of two solar calibrators (USGS 2007).

The Landsat-7 system is designed to collect 7 bands or channels of reflected energy and one channel of emitted energy. The flight altitude of Landsat 7 and the scene size of ETM+ are same as those of Landsat 5 and TM, 705 km and  $170 \times 183$  km respectively (Table 2.4). Both Landsat 5 and Landsat 7 orbits are sun synchronous. The nominal mean sun time of the descending node at the Equator is 10:00 a.m..

A major objective of the Landsat-7 program is to upgrade the radiometric quality of the data to be commensurate with the other sensors in the Earth Observing System. Unlike its predecessors, a specific goal of the Landsat-7 program is to achieve radiometric calibrations of the data to  $\pm 5\%$  uncertainty over the 5 year life of the mission.

For all Landsat 7 ETM+ data, raw uncorrected, systematic correction and gap-filled (scan line corrector, SLC-off, only) are available to the general public (including SLC-off products). Precision correction and terrain correction are available to approved USGS researchers only for all Landsat 7 ETM+ data (including SLC-off products). Level 1G products have been applied in the Finnish MS-NFI9. They include both radiometric and geometric correction. Image data are provided in rescaled 8-bit unsigned integer (DN) values.

An instrument malfunction of ETM+ occurred onboard Landsat 7 on May 31, 2003. The problem was caused by failure of the SLC, which compensates the effect of the forward motion of the satellite on the image. Subsequent efforts to recover the SLC were not successful, and the problem appears to be permanent (USGS 2007). The problem SLC has had a major impact on the global earth science community, including the Finnish MS-NFI. The global user community has recognized the immediate impact of lost data and has shown great concern over the plans for future systems.

### **2.2.4 IRS-1C and IRS-1D**

The Indian Remote Sensing Satellite IRS-1C, was launched on December 28<sup>th</sup>, 1995, and its identical twin IRS-1D on September 29<sup>th</sup>, 1997 by the Indian Space Research Organization. Sensors aboard include a panchromatic (black-and-white) sensor collecting 5.8 m resolution images, a multispectral (colour) sensor LISS-III collecting 23.5 m images, and a wide-field multispectral sensor collecting 188 m resolution images (Table 2.5) (ISRO 2007).

LISS-III operates in four spectral bands. There is a separate optics and detector array for each band. Three bands (B2, B3 and B4) are in the visible and near infrared region. Band 5 is in the short wave infrared region.

IRS standard data products are offered with two processing levels – radiometrically corrected and system corrected. System corrected is the higher level, which includes radiometric and geometrically corrected data.

**Table 2.5** The technical properties of IRS-1 C and IRS-1 D LISS-III sensors.

Band	2 (red)	3 (green)	4 (NIR)	5 (SWIR)
Bandwidth ( $\mu\text{m}$ )	0.52–0.59	0.62–0.68	0.77–0.86	1.550–1.700
Spatial resolution (m)	23	23	23	70
Swath-width/image size (km)	142 (IRS-1 C), 127-141 (IRS-1 D) 141 $\times$ 141			141 $\times$ 148
Repetition (days)	2–26 at the Equator			

## 2.3 Digital Map Data

### 2.3.1 *The Use of the Map Data*

Digital map data are used to reduce the errors in the estimates. The errors in both the area and total volume estimates can be reduced significantly by the multi-source method if the differentiation of forestry land from non-forestry land can be supported by digital map information in addition to satellite images (Tomppo 1996). The map information is used to separate forestry land from other land classes, such as arable land, built-up areas, roads, urban areas and single houses. The effect of possible map errors on small-area estimates is reduced by using one of two alternative statistical methods (Katila et al. 2000; Katila and Tomppo 2002). The first is a calibration method using a confusion matrix derived from the land class distributions on the basis of field plot data and map data, and the second employs stratification of the field plots on the basis of map data (see Subsection 3.2.5). In addition, the map data are used to stratify the forestry land area and the corresponding field plots into a mineral soil stratum and a peatland soil stratum (i.e. spruce mires, pine mires, open bogs and fens). This stratification decreases the prediction and estimation errors due to the fact that mineral soils and different types of organic soils (peatland soils) can have significantly different spectral signatures even when the growing stock is the same (e.g., Katila and Tomppo 2001).

Almost all the map data were obtained from the National Land Survey of Finland (NLS), most often in raster format. The road data were rasterized from vector format to 25  $\times$  25 m pixel size. Some of the raster data were obtained in finer resolution and generalised to MS-NFI pixel size. The main principle in the rasterization and generalisation was to keep the total area covered by the map theme same as in the original data. The visual appearance of the non-forestry land classes in the MS-NFI output map was considered to be of secondary importance. The different map data were overlaid, ordered by the known accuracy of the data. The most precise map data was the final layer on the land use map. However, for the purposes of the calibration method (Subsection 3.2.5), the overlaying was done in such a way that the formed map stratum would be as homogeneous as possible with respect to the NFI field plot based land class distribution (Table 2.6) (Katila et al. 2000). The main objective was to obtain as precise estimate as possible for the combined forest land, poorly productive forest land and unproductive forest land (denoted by forestry land) compared to the NFI field data based estimate employing the combined digital land use map (Fig. 3.2b).

**Table 2.6** Map stratification used in calibration in Häme-Uusimaa forestry centre.

Code (h)	Stratum
1	Forestry land
2	Arable land
3	Buildings and urban area
4	Roads
5	Other built-up land
6	Water

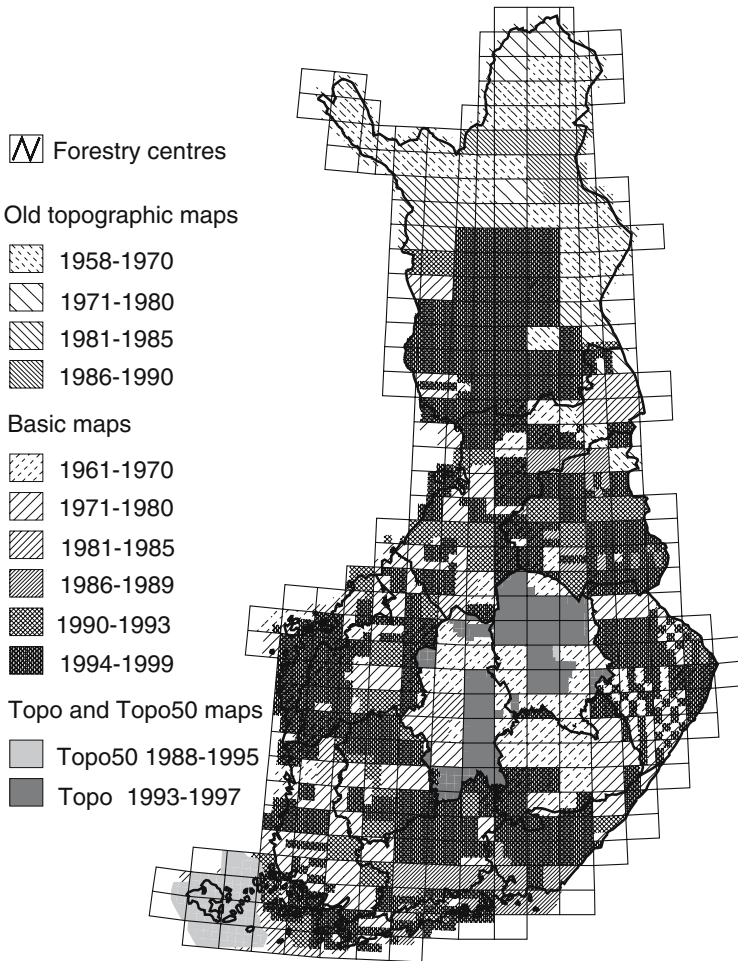
### 2.3.2 *The Main Sources of Map Data*

There was a digital land use map available from the MS-NFI8 (Tomppo et al. 1998b) but updated and more accurate map data were purchased from NLS during the course of MS-NFI9. Most of the map data from MS-NFI8 had been combined from separate elements (Map data I) but data was available from the 1:50,000 topographic map database in southern Finland (Map data II, TOPO50) and more of these data were acquired from NLS (Fig. 2.5) (Maastotietojen keruuohje 1996). TOPO50 map elements covered arable land, waters, peatlands and urban areas. The initial materials to TOPO50 were the old topographic maps, which were updated using high-altitude aerial photographs. Polygons smaller than 1,000 m<sup>2</sup> were removed in the generalisation process (Maastotietojen keruuohje 1996).

Since 1997, the majority of the updated map data came from the most accurate source: NLS topographic database (Map data III, TOPO) (Fig. 2.5, Table 2.7) (Maanmittauslaitoksen maastotietokohteet 2005). The topographic database has the most accurate positional data and is comparable to maps on scale 1:5,000–1:10,000. The Topographic Database is continuously updated and currently it covers the whole of Finland, except for the northernmost parts of Lapland. There are two production categories in TOPO maps: ‘A’ areas (stereo mapping), where the positional accuracy is about 5 m (most of Finland), and in category ‘B’ areas, where the accuracy is about 20 m (Maanmittauslaitoksen maastotietokohteet 2005). The map elements covering arable land, waters, peatlands and other built-up areas (not urban areas) were extracted from the database and rasterized to 25 × 25 m pixel size (Table 2.7).

### 2.3.3 *Peatland*

The spectral response of peatlands differs from that of mineral soils with the same growing stock. In addition, some peatlands cannot be separated from mineral soils by means of remote sensing. Therefore, digital peatland information is used in order to improve the accuracy of MS-NFI estimates (Tomppo 1996; Katila and Tomppo 2001). The site class definition is vegetation-based in the NFI: the forest



**Fig. 2.5** The area covered by arable land map data elements from 1:50,000 basic maps, 1:50,000 topographic database (TOPO50), topographic database (TOPO) and 'perusCD' digital map from 2000 and the boundaries of forestry centres. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

stand is considered to be peatland (spruce mires, pine mires, open bogs and fens) if the organic layer covering the mineral soil is peat or if 75% of the understorey vegetation is peatland vegetation (Lehto and Leikola 1987). A geological definition of peatlands is used for the topographic mapping: peatland is covered mainly by peat vegetation and the thickness of peat layer is over 30cm. Thus, the peatland mask can not be used in a categorical way, but it is used to stratify the forestry land area and corresponding field plots for subsequent analysis in the estimation phase.

TOPO50 or TOPO peatland data consisted of subclasses of open bogs, woody peatlands and paludified lands. It was therefore possible to stratify the peatlands in

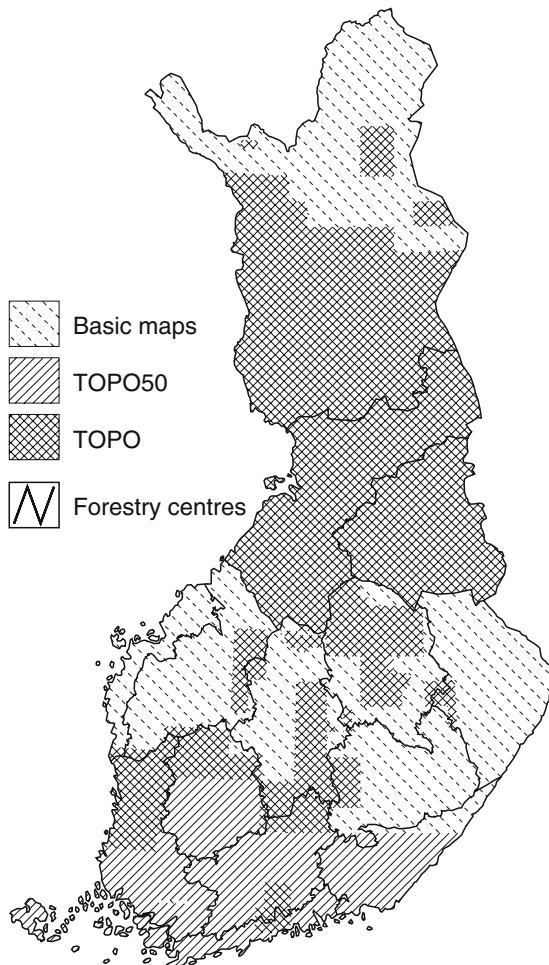


**Table 2.7** Sources and quality of the numerical map data.

Map theme(s)	Delivered by	Scale	Date of mapping	Area covered	Format	Data source
Arable land	NLS	1:50,000	1958–1990	See Fig. 2.5	Raster	Base maps
Peatlands	NLS	1:100,000	1954–1987	See Fig. 2.6	Raster	Topographic maps
Houses	NLS/PRC	–	1993	Whole country	Raster	HR
Urban areas	Statistics Finland	–	1991	See Fig. 2.7	Raster	HR
Roads	NLS	1:20,000	1994, 1997, 2001, 2002	Whole country, see Fig. 2.9	Raster	Road data base
Peat production areas	Metla/NFI	Raster 25m	1990–1994	Whole country, except TOPO in Fig. 2.5	Raster	Digitized from satellite images
Municipality borders	NLS	1:100 000	1995–2002	Whole country	Vector	Administrational boundaries
TOPO50: arable land, water, urban areas, peatlands	NLS	1:50,000	1988–1995	See Fig. 2.5	Raster	Topographic maps 1:50,000
Topographic database: arable land, water, urban areas, peatlands, other built-up areas, open rocky soils, meadows, gardens	NLS	1:10,000 or 1:20,000	1993–1999	See Fig. 2.5	Raster	Topographic database
PerusCD: arable land, water	NLS	1:20,000	1958–1999, mostly 1990–1999 in southern and central Finland	See Fig. 2.5	Raster 2 m	Base maps and topographic atabase

Abbreviations: Metla = Finnish Forest Research Institute, NLS = National land survey of Finland, HR = Housing register, PRC = Population Register Centre.

the k-NN estimation into open bogs and woody peatlands (Subsection 3.2.2). Paludified peatlands, most often corresponding to spruce mires, were included to woody peatlands. Where these data were not available, the peatland map data scanned from basic maps (scale 1:100,000) or GT-maps (scale 1:200,000) was used (Map data I) (Fig. 2.6, Table 2.7). Apart from being out-dated, these data contained serious geometrical errors of up to 125 m (Tomppo et al. 1998b). Thin peat layer mires (often spruce dominated) were missing from these data. In the TOPO50 and TOPO mapping process, the transformed peatlands, in which ground vegetation resembles that of mineral soils, were not included to peatland element. Tomppo



**Fig. 2.6** The area covered by 1:100,000 peatland maps (Basic maps), 1:50,000 topographic database (TOPO50) and topographic database (TOPO) and the boundaries of forestry centres. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

et al. (1998b) noticed that the drained peatlands were missing particularly from TOPO50, but also from 1:100,000 peatland maps.

The accuracy of the scanned peatland map data (Table 2.8) and TOPO50 and TOPO peatland maps together (Table 2.9) was tested by comparing them against the main site class data from the NFI field plots. The percentage correctly classified NFI plots to peatland or mineral soil was 81.6% and 87.9% for Map data I peatlands and TOPO50 and TOPO peatlands, respectively. The accuracy of the Map data I was poorer, as was expected due to error sources mentioned above. The proportion of peatlands was underestimated by 25% and 14% for Map data I peatlands and TOPO50 and TOPO peatlands, respectively. The spruce dominated mires were missing both from Map data I (68%) and also from TOPO50 and TOPO (50% of plots), while the open bogs were fairly accurately covered by Map data II and III. The two peatland elements covered both peatland rich (Forestry Centres 7, 11, 12 and 13) and poor areas (Fig. 2.6).

### 2.3.4 Arable Land

Arable land is the third largest land class after forestry land and inland waters (Table 2.10). Most of the land use changes occur between arable land and other land classes (Tomppo et al. 2001b). The oldest map elements used were from the basic maps of the scale 1:50, 000, partly used in Central Finland, forestry centres 8 and 9

**Table 2.8** The confusion matrix of NFI field plot main site class (forestry land) against the 1:100,000 peatland maps (areal cover in Fig. 2.6).

NFI field plot main site class		Peatland map		
		Peatland	Mineral soil	Total
Mineral land	No. plots	1,264	15,212	16,476
	(%)	5.28	63.58	68.87
	Row (%)	7.67	92.33	
	Column (%)	22.67	82.90	
Spruce mire	No. plots	765	1,649	2,414
	(%)	3.20	6.89	10.09
	Row (%)	31.69	68.31	
	Column (%)	13.72	8.99	
Pine mire	No. plots	2,864	1,343	4,207
	(%)	11.97	5.61	17.58
	Row (%)	68.08	31.92	
	Column (%)	51.37	7.32	
Open bog	No. plots	682	145	827
	(%)	2.85	0.61	3.46
	Row (%)	82.47	17.53	
	Column (%)	12.23	0.79	
Total	No. plots	5,575	18,349	23,924
	(%)	23.30	76.70	100.00

**Table 2.9** The confusion matrix of NFI field plot main site class (forestry land) against the TOPO50 and TOPO peatland map subclasses (areal cover in Fig. 2.6).

NFI field plot main site class		Peatland map			Total
		Open bog	Mire	Mineral soil	
Mineral land	No. plots	32	1,523	26,302	27,857
	(%)	0.07	3.55	61.31	64.93
	Row (%)	0.11	5.47	94.42	
	Column (%)	1.69	13.77	87.83	
Spruce mire	No. plots	30	2,076	2,072	4,178
	(%)	0.07	4.84	4.83	9.74
	Row (%)	0.72	49.69	49.59	
	Column (%)	1.58	18.78	6.92	
Pine mire	No. plots	377	6,975	1,458	8,810
	(%)	0.88	16.26	3.40	20.54
	Row (%)	4.28	79.17	16.55	
	Column (%)	19.87	63.08	4.87	
Open bog	No. plots	1,458	483	114	2,055
	(%)	3.40	1.13	0.27	4.79
	Row (%)	70.95	23.50	5.55	
	Column (%)	76.86	4.37	0.38	
Total	No. plots	1,897	11,057	29,946	42,900
	(%)	4.42	25.77	69.80	100.00

**Table 2.10** Land classes in Finland according to NFI9.

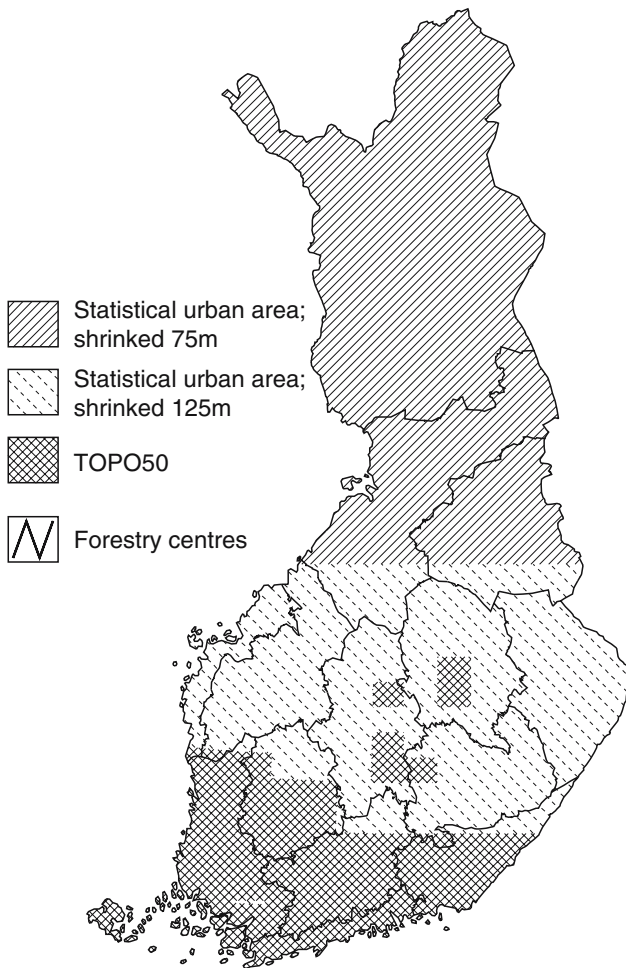
Land class	1,000ha
Forestry land	30,447
Arable land	2,794
Built-up areas	935
Transport Routes etc.	401
Inland watercourses	3,367

(Fig. 2.5). These map elements had been scanned by NLS to the 25 × 25 m pixel size. A transformation and resampling to the Uniform Coordinate System had been carried out, if the original projection zone in Basic Coordinate System differed from this (The Finnish Coordinate Reference ... 2007). The field work for this map data was carried out between 1961–1990. These data obviously contain both positional and temporal errors (Tomppo et al. 1998b). In other Forestry centres, the TOPO50 or TOPO map data was used. In the year 2000, the whole arable land element was updated when the ‘PerusCD’ digital map, corresponding to 1:20,000 printed maps, was obtained. The main data source for ‘PerusCD’ was the TOPO database but in some regions – especially Lapland – map sheets were still from the 1:20,000 basic maps and dated from 1958–1990 (Fig. 2.5). In the NFI, the arable land class also includes land under farm buildings and their surroundings, as well as farm tracks, which may in turn be covered by the road map element (see accuracy analysis, Subsection 2.3.8).

### 2.3.5 Urban Areas, Houses and Other Built-Up Areas

The coordinates of each house in Finland are kept in a housing register provided by the Population Register of Finland. Buildings, when not covered by the urban or built-up area mask, are presented as squares of a size of 50 × 50 m. The four pixels which were closest in the geographical space to the house and which composed a square were classified as the area covered by the house. These data were for the year 1993. It should be noted that approximately 25% of the buildings were missing from the register, most of them outside urban areas (Mikkola 1997).

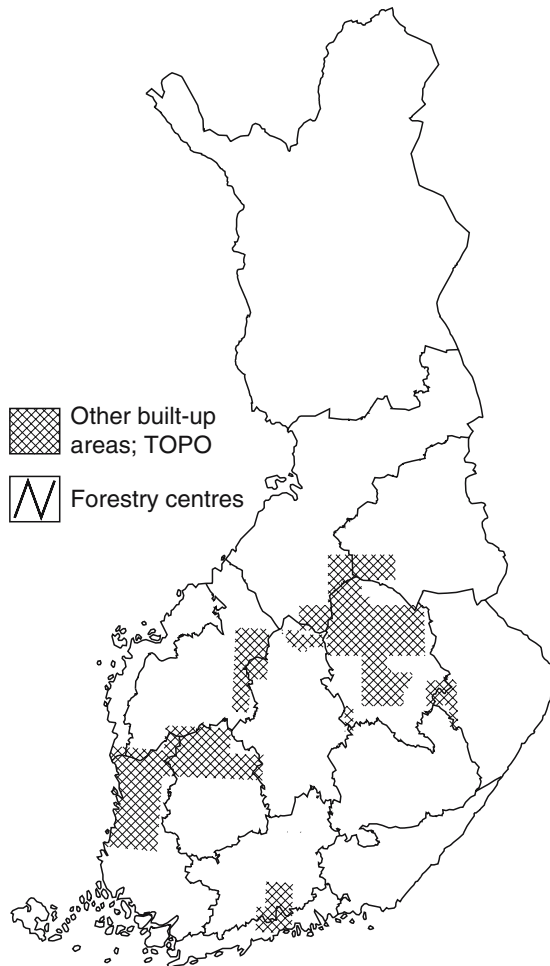
TOPO50 elements contained urban areas – residential buildings and industrial buildings (Fig. 2.7). Elsewhere, the urban area was derived from the housing register



**Fig. 2.7** The area covered by statistical urban areas from Statistics Finland buffered down 125 m or 75 m and 1:50,000 topographic database for urban areas (TOPO50) and the boundaries of forestry centres. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

as follows: a group of houses with at least 200 inhabitants and covering a mutual distance of no more than 200m formed an urban area and this was combined into a connected built-up land polygon. These vector-form data were purchased from Statistics Finland and were converted into raster format after being buffered down by 75 m or 125 m to avoid the overestimation of urban areas (Tomppo et al. 1998b). These data originate from 1991.

TOPO map data contained a class of other built-up areas: e.g. mineral resources extraction areas, peat production areas, landfill areas, cemeteries, airfields, parks, sports and recreation areas. Separate digitization from satellite images was made for these areas (Fig. 2.8).



**Fig. 2.8** The area covered by other built-up areas by the topographic database (TOPO) and the boundaries of forestry centres. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

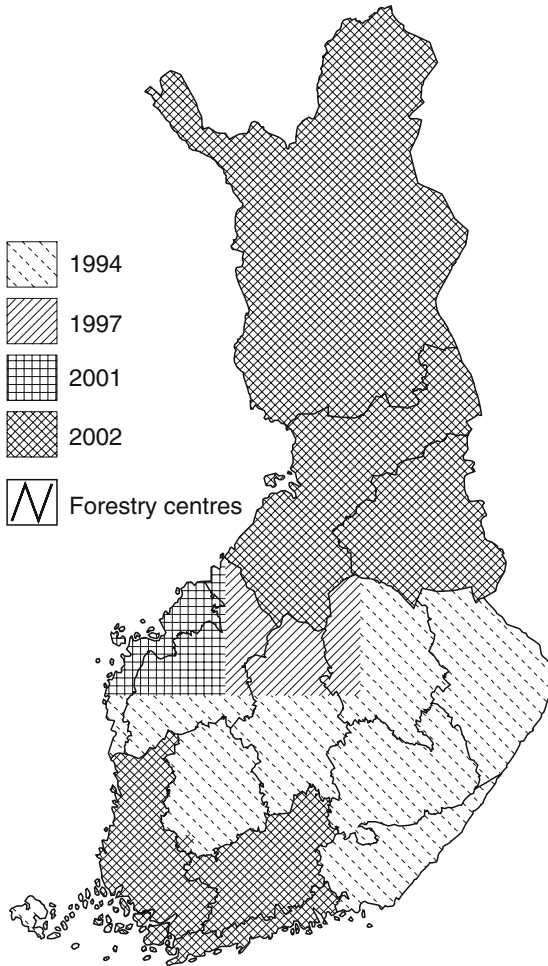
The peat production areas cover large and homogeneous areas in Central and northern Finland and are relatively easy to separate and digitize from satellite images because of their relatively high visible spectral channel values. However, the digitizer must evaluate whether the particular polygon is in or out of production. Simple supervised image classification methods were also applied to separate open mineral soil areas, especially mineral extraction areas.

### 2.3.6 Roads

The road database of NLS is the most accurate data available in Finland. The vector format data was rasterized to  $25 \times 25$  m pixel size. The road class information was used to define the width of the road (13–75 m) in the rasterization process. In general, the narrow-line-type land use elements are sensitive to errors in location and areal coverage due to rasterization to a coarser scale. The continuity of the resulting rasterized roads was not considered important. The data originated from the period 1994 to 2002 (Table 2.7, Fig. 2.9).

### 2.3.7 Water

The delineation of water was taken from TOPO50 and TOPO map data where possible. The 'PerusCD' digital map data was also used where possible after year 2000 (Fig. 2.10). In Central Finland, the water areas were delineated from satellite image prior to the MS-NFI estimation applying following procedure: (1) The 'definitely water' threshold employed the rule ( $p \in W \mid NIR/(R + c) < 1$ ), where *NIR* and *R* are near infrared and red spectral channel values of Landsat TM or ETM+ images, respectively, and *c* is a small integer value to fine-tune the result; (2) Create a 2–3 pixel buffer around the obtained delineation; (3) Threshold the water on the buffer zone applying near infrared spectral channel values only. Phase (3) delineation, applying a conservative threshold, was used also on areas with water map data to 'backup' the cases of possible missing map data or seasonal changes in the water level. An additional constraint to the above masks and water thresholds was applied in the k-NN estimation by using a digital elevation model: for the water pixels, the angle between solar illumination and the terrain normal should deviate little from the angle defined for flat terrain (Tomppo et al. 1998b). In the areas where no water map data was available, the comparison of the water area estimates from the created mask was done against the official land area statistics of NLS (Suomen pintatalo kunnittain 2006). The map database water masks are usually more accurate because they contain the wetland areas that are difficult to separate from satellite images. However, the statistical control of water area estimates obtained from numerical map data is also necessary; e.g. the rasterization of 'perusCD' from 2 m resolution to 25 m resolution produces different results depending on the parameters applied. An accurate water mask is important in the MS-NFI because the low spectral channel values of water typically can be confused with high growing stock forests in the k-NN estimation.

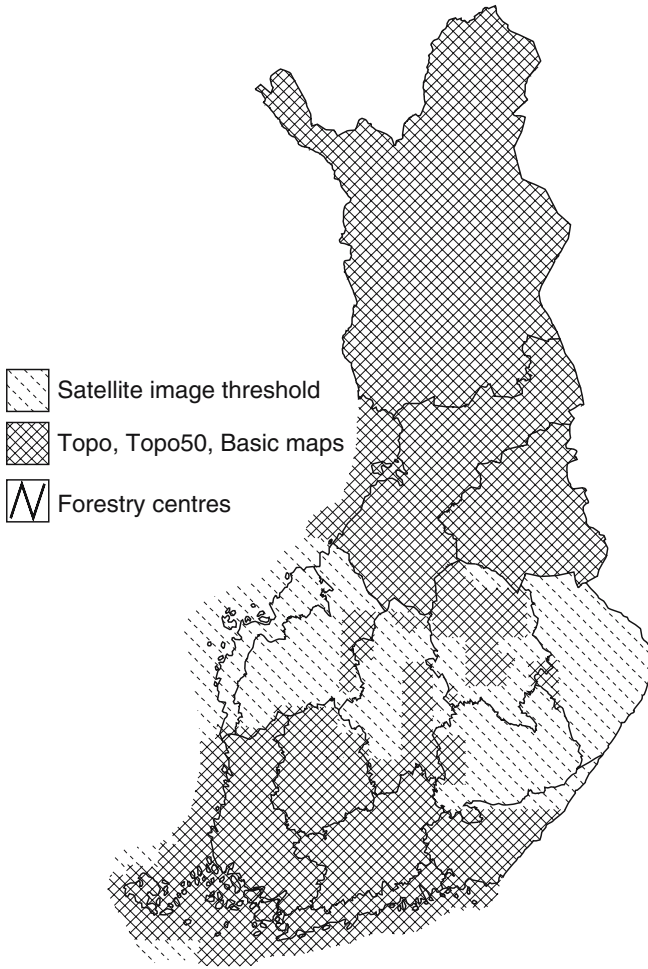


**Fig. 2.9** The area covered by the road database from 1994, 1997, 2001 and 2002 and the boundaries of forestry centres. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

### 2.3.8 Accuracy of the Combined Land Use Map Data

The accuracy of the MS-NFI9 land use map data is estimated by applying a confusion matrix between the map and field based land classes of the NFI field plot data. The NFI land classes were combined to five classes. The tables are presented separately for South Finland (Table 2.11) and North Finland (Forestry centres 11, 12 and 13) (Table 2.12) because the proportion of the non-forestry land classes is clearly smaller in North Finland. Separate matrices are not presented in the Map data I and TOPO50 and TOPO maps. The percentage of correctly classified land classes were 92.2% and





**Fig. 2.10** The area where water was delineated from the satellite image and where water element from map data was used and the boundaries of forestry centres. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

96.3% for South Finland and North Finland, respectively. The ultimate goal is to separate the forestry land from other land use and in this context the percentage of correctly classified NFI plots were 93.6% and 96.7%, respectively. The forestry land area was overestimated by 2.7% and 0.8% in South Finland and North Finland, respectively. The arable land element underestimated the proportion of arable land while built-up land was underestimated in South Finland. It should be noted that map data for land under by power lines and railroads was missing from the MS-NFI land use map. Despite this, rasterized roads significantly overestimate the land under roads, railways and power lines. The water delineation is quite accurate, but this is partly due to the large amount of water plots located on the sea: the NFI sampling grid covers sea

**Table 2.11** The confusion matrix of field based land class against the land use according to combined map data on NFI field plots in South Finland.

NFI field plot land class		Land use map					
		Forestry land	Arable land	Built up land	Traffic and power lines	Water	Total
Forestry land	No. plots	40,904	428	197	931	201	42,661
	(%)	55.53	0.58	0.27	1.26	0.27	57.92
	Row (%)	95.88	1.00	0.46	2.18	0.47	
	Column (%)	93.32	5.52	13.44	40.80	1.10	
Arable land	No. plots	941	7,184	128	341	10	8,604
	(%)	1.28	9.75	0.17	0.46	0.01	11.68
	Row (%)	10.94	83.50	1.49	3.96	0.12	
	Column (%)	2.15	92.65	8.73	14.94	0.05	
Built up land	No. plots	1,142	95	1,076	303	56	2,672
	(%)	1.55	0.13	1.46	0.41	0.08	3.63
	Row (%)	42.74	3.56	40.27	11.34	2.10	
	Column (%)	2.61	1.23	73.40	13.28	0.31	
Traffic and power lines	No. plots	546	34	61	703	3	1,347
	(%)	0.74	0.05	0.08	0.95	0.00	1.83
	Row (%)	40.53	2.52	4.53	52.19	0.22	
	Column (%)	1.25	0.44	4.16	30.81	0.02	
Water	No. plots	300	13	4	4	18,053	18,374
	(%)	0.41	0.02	0.01	0.01	24.51	24.95
	Row (%)	1.63	0.07	0.02	0.02	98.25	
	Column (%)	0.68	0.17	0.27	0.18	98.53	
Total	No. plots	43,833	7,754	1,466	2,282	18,323	73,658
	(%)	59.51	10.53	1.99	3.10	24.88	100.00

areas all the way to the interior water frontier. If the NFI plots on water or on the water mask are excluded, the correctly classified percentages of forestry land/non-forestry land are respectively 92.3% and 96.8% in South Finland and North Finland. The accuracy estimates of single land class themes from the map are not precise because the map elements are overlaid and overlapping (as discussed in Subsection 2.3.1).

### 2.3.9 Digital Boundaries of the Computation Units

The basic computation unit in the multi-source inventory is the municipality, of which there were 416 at the beginning of 2007. Their land areas range from around 1,000 ha to some hundreds of thousands of hectares. Digital municipality boundaries are used to delineate the units (Tomppo 1996). The boundary information was obtained in vector-form at a scale of 1:100,000. The map data were from 1995–2002. New versions of the map data were purchased as the NFI proceeded. In this book, the set of municipalities and their boundaries were used as they were on 1.1.2007 but the land areas of the municipalities employed are from the field

**Table 2.12** The confusion matrix of field based land class against the land use according to combined map data on NFI field plots in North Finland (forestry centres 11, 12 and 13).

		Forestry land	Arable land	Built up land	Traffic and power lines	Water	Total
Forestry land	No. plots	23,779	61	73	220	30	24,163
	(%)	82.61	0.21	0.25	0.76	0.10	83.95
	Row (%)	98.41	0.25	0.30	0.91	0.12	
	Column (%)	97.65	7.05	20.92	45.64	1.10	
Arable land	No. plots	169	787	19	31	2	1,008
	(%)	0.59	2.73	0.07	0.11	0.01	3.50
	Row (%)	16.77	78.08	1.88	3.08	0.20	
	Column (%)	0.69	90.98	5.44	6.43	0.07	
Built up land	No. plots	143	16	239	28	2	428
	(%)	0.50	0.06	0.83	0.10	0.01	1.49
	Row (%)	33.41	3.74	55.84	6.54	0.47	
	Column (%)	0.59	1.85	68.48	5.81	0.07	
Traffic and power lines	No. plots	148	1	16	201	0	366
	(%)	0.51	0.00	0.06	0.70	0.00	1.27
	Row (%)	40.44	0.27	4.37	54.92	0.00	
	Column (%)	0.61	0.12	4.58	41.70	0.00	
Water	No. plots	112	0	2	2	2,702	2,818
	(%)	0.39	0.00	0.01	0.01	9.39	9.79
	Row (%)	3.97	0.00	0.07	0.07	95.88	
	Column (%)	0.46	0.00	0.57	0.41	98.76	
Total	No. plots	24,351	865	349	482	2,736	28,783
	(%)	84.60	3.01	1.21	1.67	9.51	100.00

inventory year (cf. calibration to official land areas, Subsection 3.2.5). Some very small land area changes were not acknowledged in the applied boundary dataset.

The forest resource estimates have also been computed for ownership groups within municipalities. These groups include privately-owned forests, state-owned forests managed by the Finnish Forest and Park Service and company owned forests. The land areas of the three ownership groups have been constructed using the boundaries of the two last ownership groups, the rest being classified as private owned forests. Some applications have also employed the digital boundaries of protected forests provided by Finnish Environment Institute.

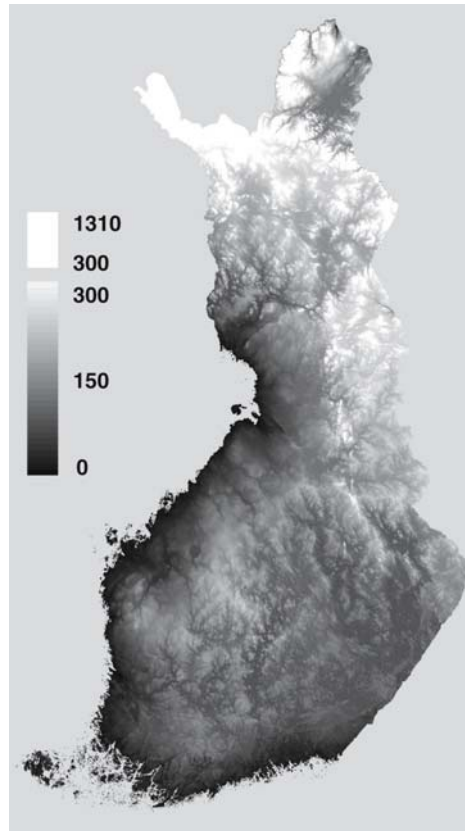
## 2.4 Digital Elevation Model

A digital elevation model is used in two ways, for stratification on the basis of elevation data and for correcting the spectral values by reference to the angle between solar illumination and the terrain normal (Subsection 3.1.2). Stratification in this context means of using the maximum vertical distance from a pixel to its nearest neighbours. The selection of parameters for stratification and spectral correction has been studied by Katila and Tomppo (2001).

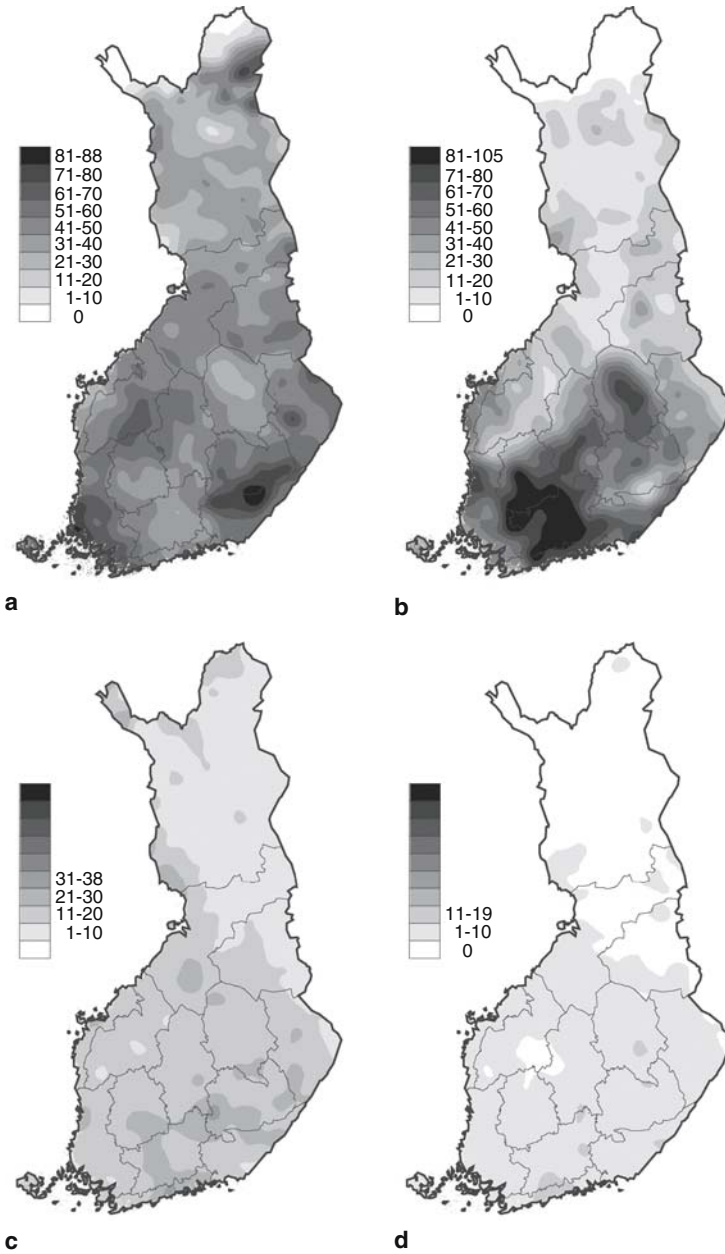
The digital elevation model (DEM) employed was a raster file with a horizontal spatial resolution of  $25 \times 25$  m and with a vertical resolution of 0.1 m (Fig. 2.11). The original elevation data of the National Land Survey of Finland is an elevation contour and sea coastal line vector file at the scale of 1:10,000. The original vertical contour interval was either 5 m or 2.5 m. The raster file was prepared by means of the triangulation network interpolation method (Digital Elevation Model 2007). The DEM was employed to the whole of Finland.

## 2.5 Large Area Forest Resource Data

The basic k-NN method was employed in NFI8 and the improved ik-NN method was introduced during NFI9. The latter employs a coarse scale variation in the key forest variables to guide the selection of field plots from which the data are



**Fig. 2.11** The digital elevation model. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.



**Fig. 2.12** Large scale variation of mean volumes (m³/ha) of pine (a), spruce (b), birch (c) and other deciduous tree species (d) with boundaries of forestry centres. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

transferred to the pixel to be analysed. The variation is presented in the form of coarse-scale digital forest variable maps (Fig. 2.12), derived either from the current inventory data or from the data of the preceding inventory. In MS-NFI9, the field data from NFI9 was employed.

The data produced by the NFI9 (1996–2003) for southern Finland were already available when the method was introduced. The inventory progressed by regions, and new large-area maps were created for the MS-NFI calculation whenever the field data for one region were available. There were 81,249 field plots on land across the entire country in the NFI9 of which 67,264 were on forestry land, 62,266 on combined forest and poorly productive forest land (FPPF), and 57,457 were on forest land alone. All the plots on FPPF were used for the final large-area maps.

The variables were selected in such a way that their values indicate the areas in which the covariance structure between field variables and image variables would be approximately constant. It is assumed that the mapping from field data to image data, conditional for large-scale forest variables, is a bijection. A function,  $f: A \rightarrow B$ , is bijective, or a bijection, or a one-to-one correspondence, if it is both injective (no two values map to the same value) and surjective (for every element of  $B$  there is some element of  $A$  which maps to it). In other words, there is exactly one element of  $A$  which maps to each element of  $B$ . Tree species composition or vegetation zones may reflect such areas in Finnish forests. Volumes by tree species on FPPF were therefore selected as variables. These variables also describe the average variation in the key inventory variables to be estimated in k-NN analysis. The maps were created as follows: the averages of the plot-level mean tree stem volumes ( $\text{m}^3/\text{ha}$ ) were computed by field plot clusters and a map of Finland with a pixel size of  $1 \times 1 \text{ km}$  was ‘filled’ with these cluster-level averages using a nearest neighbour method, i.e. the values were taken from the nearest cluster (in geographical space). The map was filtered three times using a moving average with window sizes of  $20 \times 20 \text{ km}$ ,  $11 \times 11 \text{ km}$ , and  $25 \times 25 \text{ km}$  (Fig. 2.12).

# Chapter 3

## Methods

**Abstract** The chapter explains the image processing and statistical methods employed in the Finnish multi-source forest inventory. Section 3.1 is a brief overview of satellite image rectification and radiometric correction methods. The statistical methods are presented in Section 3.2, including the use of field inventory data alone. Field data based estimates are employed for validating the MS-NFI estimates for large areas. The basic k-nearest neighbour technique (the k-NN method) as well as the principles of k-NN estimation are presented. The improved version of the k-NN method, the ik-NN method, introduced during the MS-NFI9, is explained, as well as the selection of the estimation parameters and the latest developments in error estimation are discussed.

**Keywords** Multi-source forest inventory, national forest inventory, satellite images, genetic algorithm, k-nearest neighbours, small-area estimation, stratification, statistical calibration

### 3.1 Image Rectification and Pre-processing of Data

#### 3.1.1 Satellite Image Rectification

All images were rectified to the national uniform coordinate system. Point-type objects (e.g., small islands) were identified on both the satellite images and the basic maps and a regression model was fitted to their image coordinates and map coordinates. Second-order polynomial regression models were usually employed for this purpose:

$$\begin{aligned} u &= a_1 + b_1x + c_1y + d_1x^2 + e_1y^2 + f_1xy + \varepsilon_u \\ v &= a_c + b_cx + c_cy + d_cx^2 + e_cy^2 + f_cxy + \varepsilon_v \end{aligned} \quad (3.1)$$

where  $u$  and  $v$  are the map coordinates,  $x$  and  $y$  the image coordinates and  $\varepsilon_u$  and  $\varepsilon_v$  the random errors. A typical number of control points would be around 50. The resulting model enables an image element, i.e. a pixel, to be assigned to each

ground element. The nearest neighbour method has been applied to re-sampling of the images to a pixel size of  $25 \times 25$  m, which is somewhat smaller than the Landsat 5 TM and Landsat 7 ETM+ pixel size, and slightly larger than the pixel size of IRS-1 C and D LISS-III pixel size (and also larger than the pixel size of the Spot 2-4 XS HRV). This size was selected for practical reasons, as narrower objects (e.g. roads) can be better distinguished than at the original resolution of Landsat 5 TM. Landsat 7 ETM+ panchromatic band was first rectified with a pixel size of 12.5 m. The final pixel size was the same 25 m as for the other bands with merging four pixels and with a spectral value that is an average of four pertinent pixels. The absolute values of the residuals in the model, i.e.,  $\hat{\epsilon}_u$  and  $\hat{\epsilon}_v$ , typically range from 0.3 pixels to 0.6 pixels.

Areas corresponding to the cloud-free parts of satellite images are used in operative applications. Forests under clouds and in cloud shadows are assumed to be similar on the average to those on the cloud-free part of the same areal unit (e.g., municipality).

### 3.1.2 Radiometric Correction by Means of Digital Elevation Model

The slope and aspect of the terrain locally change the illumination conditions of the surface and affect the reflectance from the ground and vegetation, as well as the radiance received by an imaging instrument. A digital elevation model can be employed to remove the variation of the spectral values caused by the changes in the slope and aspect of the terrain.

The angle  $\alpha$  between the sun illumination angle and terrain normal at the imaging time point is first calculated. Let us denote the azimuth of the sun from South to East by  $\phi$  and the angle from the zenith downwards by  $\theta$ . Let us denote the elevation of the neighbouring pixels of a pixel  $(i, j)$  as follows: West  $e_{i-1, j}$ , East  $e_{i+1, j}$ , South  $e_{i, j-1}$ , and North  $e_{i, j+1}$ . A unit vector towards sun illumination is  $(x_s, y_s, z_s) = (\sin(\theta)\cos(\phi), \sin(\theta)\sin(\phi), \cos(-\theta))$  and a unit vector parallel to terrain normal  $(x_n, y_n, z_n) = (i_x/s, -i_y/s, 2d/s)$ , where  $i_x = e_{i-1, j} - e_{i+1, j}$ ,  $i_y = e_{i, j-1} - e_{i, j+1}$ , and  $s = \sqrt{i_x^2 + i_y^2 + 4d^2}$ . A well known fact is that  $\cos(\alpha) = x_n x_s + y_n y_s + z_n z_s$  (e.g., Tomppo 1992).

Let us suppose that the luminance of the light from the ground and vegetation, received by the satellite instrument, follows the Lambertian cosine law, i.e., that it is proportional to the  $\cos(\alpha)$ . The normalised intensity of the light,  $I_n$ , normalised with respect to the slope and aspect variation is thus

$$I_n = I/\cos^n(\alpha) \quad (3.2)$$

where  $I$  is the original intensity, and  $0 < n \leq 1$ .

The power is needed because the Lambertian assumption does not hold for the ground and vegetation. The practical applications have shown that the value of 1 for  $n$  is too high. The same conclusion was made by Colby (1991). In practical



applications, an iterative approach and, e.g., leave-one-out cross-validation, can be applied to minimize the mean standard error and bias. The value of the power  $n$  was selected on the basis of two different criteria. The first approximate range was determined to minimise the root mean square errors and biases of the volume predictions using field plot data and leave-one-out cross-validation. The final selection was validated by checking the distribution of the volume predictions of an entire target area against the value of  $\alpha$ . An even distribution could be expected.

### ***3.1.3 Preparation of Input Data Sets***

Field measurement data, satellite images, different types of digital maps and large-area forest resource data are employed in the MS-NFI. The key input data file for the MS-NFI is the ground truth data. It consists of field plot data as well as image and map data associated to each plot. In southern Finland, those sample plots that were incorrectly located were removed from the ground truth data. In the latter part of the inventory in northern Finland, GPS was used to locate the sample plots and therefore plot removals were rarely necessary. Plots intersecting forestry land and other land classes were rejected if part of the plot located on water or fields, etc.. In these cases, due to rectification errors and map errors, the image intensities can be either from water only or from field only, causing confusion with respect to the ground truth data and thus the results. About 2–7% of the plots were excluded from the training data on the basis of these restrictions (Katila and Tomppo 2001).

The aim was to choose the satellite images in such a way that the acquisition date was from the same growth season as the field measurements. However, approximately half of the images were not from the same year as the field data. Furthermore, the field measurement years might vary within one image coverage area partly due to the inventory design when inventory proceeded by forestry centres. Plots with accomplished clear cuttings between image acquisition and field measurement dates were therefore removed from the ground truth data. Two methods were employed to remove clear-cut plots. The first method employed field information of the development class, cutting type and time of the completed cuttings. The clear-cut plots were removed if the image acquisition date was earlier than the field measurements. The second method was used if the sample plots were clear cut after field measurements. These plots were identified by comparing the image intensity values of a pixel with the measured growing stock volumes in the field data (Tomppo 1996). The method was applied to those plots that were mature stands or thinning stands, and only for field plots that belonged entirely to one stand. Before removing the plots that were clear cut after field measurement they were sorted by intensity values and visually checked by plotting the identified plots on the satellite image. Plots covered by clouds or their shadows were also removed from ground truth data.

In the image analysis (Fig. 3.1) the input data sets were (1) ground truth data, i.e., one record for each centre point plot and sub-plot and including for each plot part (1a) field data and (1b) satellite image data, (1c) digital map data, and (1d) other numeric feature data in text format, (2) a pre-processed satellite image, (3) a digital map of land classes and mire and open bog mask, (4) a digital elevation model and thereof derived image of the angle between terrain normal and sun illumination, (5) cloud and shadow delineation mask, (6) large-area forest resource data and (7) a map of computation units to calculate small-area estimates (Figs. 2.12, 3.2 and 3.3). The national uniform coordinate system was employed in the analysis. The sequential images from the same swath and all the other corresponding data sets were merged to be processed together.

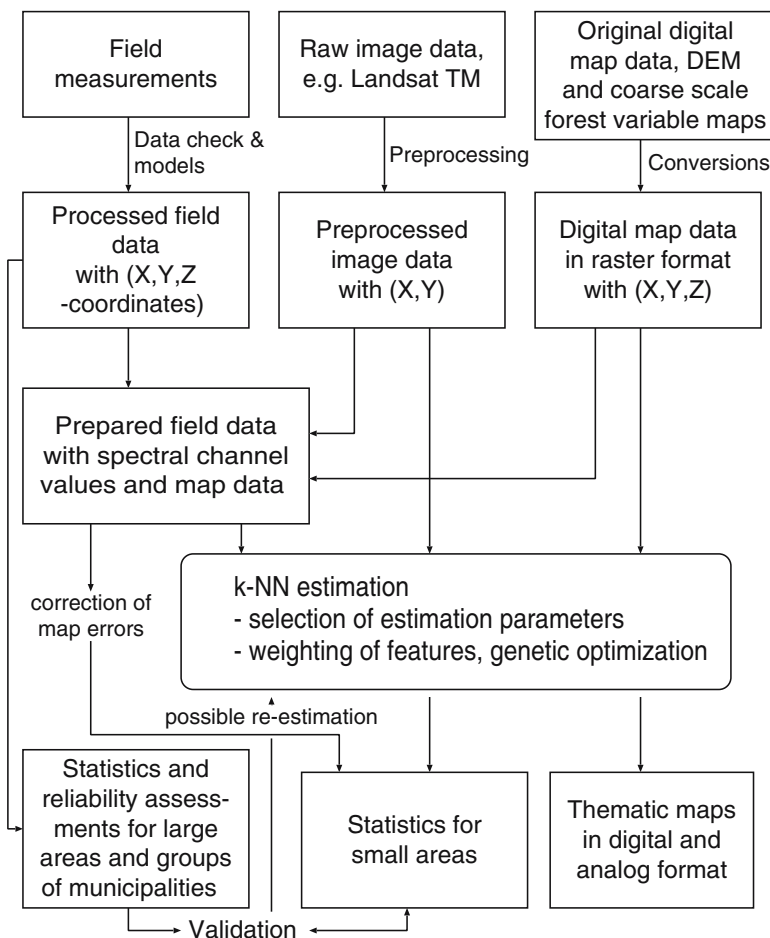
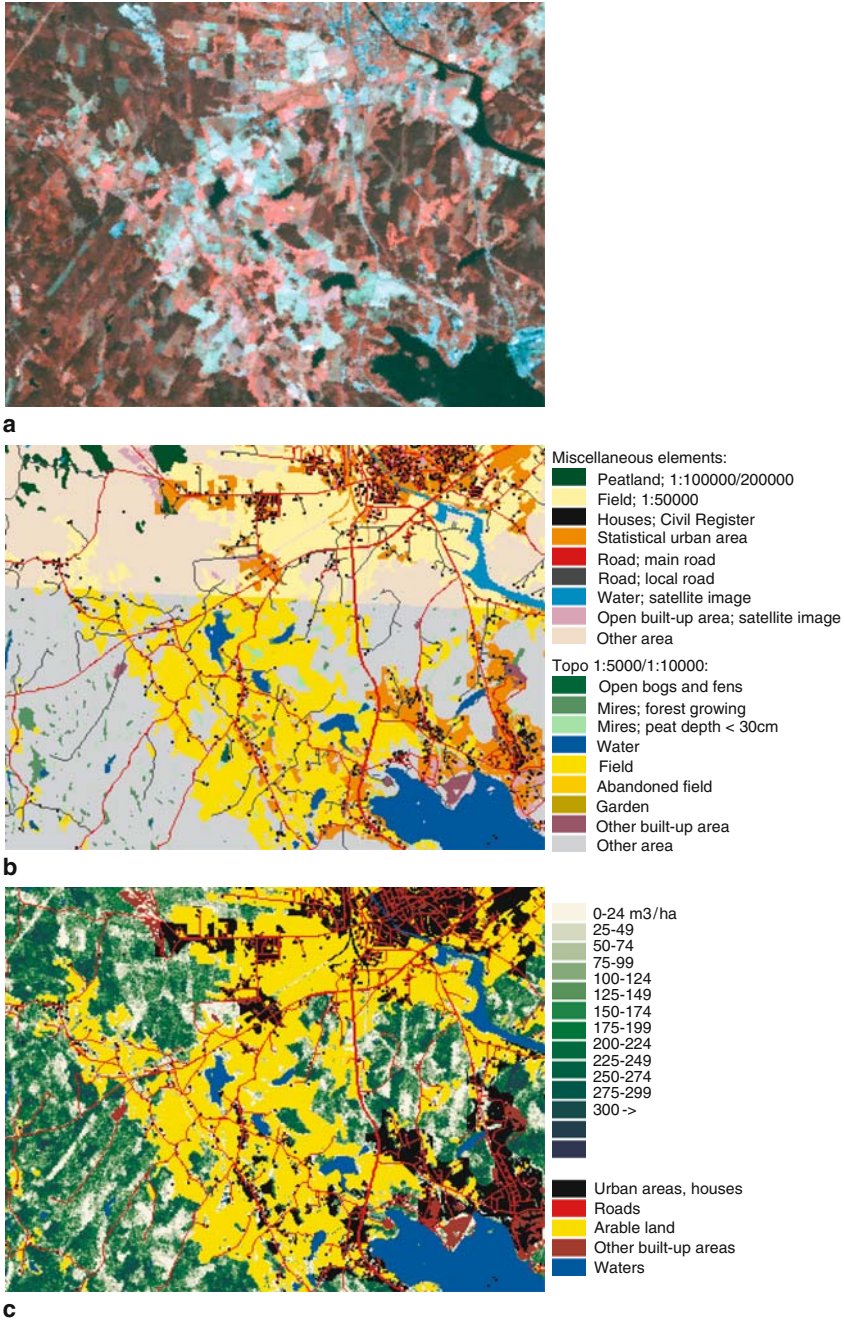
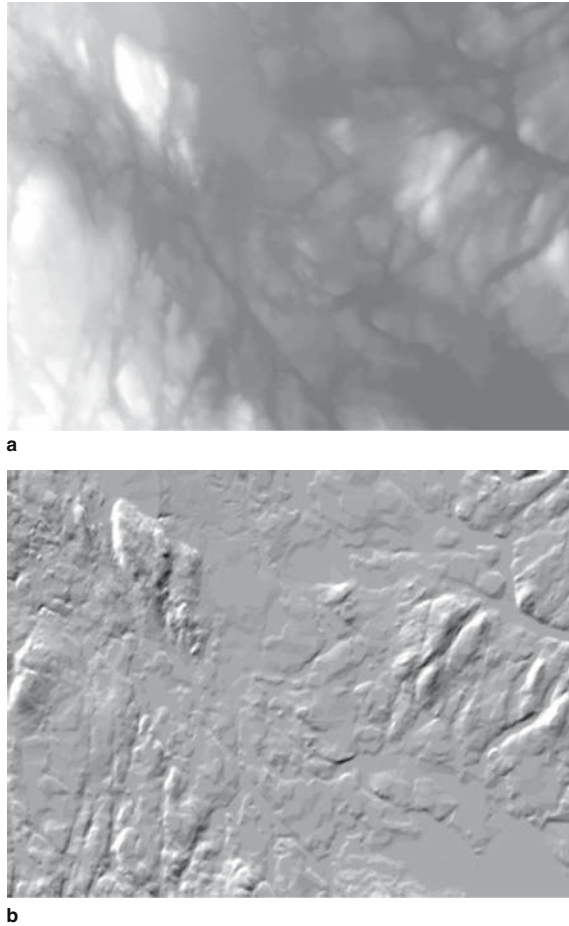


Fig. 3.1 Data flow and computational scheme for multisource NFI.



**Fig. 3.2** Examples of the Landsat TM satellite image, multichannel colour composition of channels 2, 3, and 4 (a); the elements of digital land use map data, separate map data and topographic map database (b); and MS-NFI9 thematic map of total volume (m<sup>3</sup>/ha) with other land use map data (c). Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.



**Fig. 3.3** Examples of digital elevation model (a) image of angle between the sun illumination angle and terrain normal at the image acquisition time point. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

The land class map was employed to distinguish combined forest land, poorly productive forest land and unproductive forest land (MS-NFI forestry land) from the other land classes. In this analysis all the area which was not peat production area, built-up land, arable land, roads or waters in the numerical map was considered forestry land. A threshold was used with satellite images to delineate those waters which were not in the numerical map, e.g. land covered by high water or fish ponds, as described in Subsection 2.3.7. The numerical map data were not always up-to-date and could contain significant errors. When computing the results for municipalities, the map errors were corrected based on one of the two methods presented in Subsection 3.2.5. The map errors of the thematic maps were not corrected.

## 3.2 Estimation

### 3.2.1 Field Data Based Estimation and Reliability Analysis

The estimation based on field data only is described first because the validation of the areal estimates is carried out by comparing the MS-NFI estimates with the estimates and error estimates based on field data only. The field inventory estimates and their standard errors for large regions and sub-regions (groups of municipalities) are useful when empirically assessing the systematic error of the MS-NFI estimates within a satellite image or some sub-area of it (Tomppo et al. 1998b; Katila et al. 2000). The MS-NFI estimates of, e.g. forestry land or forest land area, as well as mean and total volumes, can be combined to groups of municipalities and compared with the pure field data estimates in order to study any possible bias of the MS-NFI estimates. The area in question is divided into sub-areas with forest and other wooded land areas, ranging typically between 150,000 and 300,000 ha. This is a part of the operational product validation procedure. The comparisons for large regions are presented for Tables 1, 6a, 6b, 7a, 7b in Appendix 1.

Due to the fact that the number of plot centres on land is a random variable (depending on the design), the area estimators are ratio estimators (Cochran 1977)

$$a_s = \frac{\sum_{i=1}^n y_i}{\sum_{i=1}^n x_i} A = \frac{\bar{y}}{\bar{x}} A, \quad (3.3)$$

where  $a_s$  is the area estimate of the sub-class  $s$ ,  $A$  the land area on the basis of the official statistics of the Finnish Land Survey (Suomen ... 2003),  $y_i$  is 1, when the centre point of the plot belongs to the stratum in question and 0 otherwise,  $x_i$  is 1 when the centre point is on land and 0 otherwise, and  $n$  is the number of centre points on land (see Tomppo 2006a). Examples of land strata are forest land, spruce-dominated forest land and forest land thinned during the last 10 years.

The mean volume (m<sup>3</sup>/ha) of a stratum is estimated using the formula

$$v_s = \frac{\sum_{i=1}^n \sum_{k=1}^{n_i} u_{i,k}}{\sum_{i=1}^n x_i}, \quad (3.4)$$

where  $v_s$  is the estimate for the mean volume of a forestry land sub-class  $s$ ,  $n$  is the number of centre points of plots on land in the region,  $u_{i,k}$  is the mean volume represented by tree  $k$  in stratum  $S$  on plot  $i$ ,  $n_i$  is the number of trees in stratum  $S$  on plot  $i$  and  $x_i$  is 1 if the centre of plot  $i$  belongs to stratum  $S$  and 0 otherwise.

The total volume estimate is

$$V_s = v_s a_s, \tag{3.5}$$

where  $a_s$  is the estimate for the area of the stratum. The calculation of  $u_{i,k}$  is described in Tomppo (2006a).

The error estimation of the estimates of  $a_s, v_s, V_s$  is also complicated by the spatial autocorrelation and possible trend-like changes of the target variables, in addition to systematic sampling. Matérn (1947, 1960) suggested the error variance,  $E(m-M)^2$ , as a measure of accuracy of the estimator  $m$ . Here  $M$  is the unknown true value of the parameter. Matérn also proposed an estimator of the error variance. The estimator is applied to field plot cluster level aggregates. The application of the method is described in Heikkinen (2006). Consider the cluster-wise residuals

$$Z_r = x_r - my_r, \tag{3.6}$$

where  $x_r = \sum_{i \in r} x_i$  and  $y_r = \sum_{i \in r} y_i$  with  $r$  a cluster of field plots  $i$ , and assume that the residuals form a realisation of a second order stationary (weakly stationary) stochastic process. Here  $m$  stands for  $a$  and  $v$  in Formulas (3.3 and 3.4). The variance of the process can be estimated by means of quadratic forms of the residuals. The method is applied by sample plot density regions as follows. Within each stratum, groups  $g$  of four field plot clusters

$$\begin{matrix} r_3 & r_4 \\ r_1 & r_2 \end{matrix}$$

are composed in such a way that each cluster belongs to four different groups; a cluster being in turn lower right, lower left, upper right and upper left member of a group of four clusters (with necessary boundary modifications).

An example of the quadratic forms, as employed in the Finnish NFI, is  $T_g = (z_{r1} - z_{r2} - z_{r3} + z_{r4})^2/4$ . The standard error estimator (the square root of the error variance estimator) for each stratum is

$$s = \frac{\sqrt{k \sum_g T_g}}{\sum_i y_i} \tag{3.7}$$

where

- $g$  refers to the groups of clusters in the stratum,
- $i$  refers to the relevant sample plots in the stratum, and
- $k$  indicates how many clusters each cluster group represents (in this case,  $k = 1$ ).

The standard error estimators for the entire study area can be obtained by combining the stratum-specific estimators with the usual formula for stratified sampling (e.g., Cochran 1977).

The above procedure is relevant for strata having high enough number of field plot clusters, preferably several tens. Exact tests can be used if the stratum is very small.

### 3.2.2 *The Basic k-NN Estimation Method*

The basic non-parametric k-NN estimation was employed in the MS-NFI calculation during NFI8, and also at the beginning of NFI9. The basic principles of the k-NN method are first described. First, recall that each field plot has a certain area representatives, a plot weight sometimes called the plot expansion factor when forest inventory estimates are computed from pure field data. This plot weight can be the total land area divided by the number of field plots on land if either systematic or systematic cluster sampling is employed (Kuusela and Salminen 1969; Tomppo 2006a). In the MS-NFI, new plot weights (Formulas 3.12 and 3.13) (not equal for each plot) are computed for each plot by computation units, e.g. by municipalities (Tomppo 1996). The weights (Formulas 3.12 and 3.13) are computed for each field sample plot  $i \in F$ , where  $F$  is the set of field plots belonging to forestry land. These plot weights are sums of satellite image pixel weights over the forestry land mask pixels of the computation unit. The pixel weights (Formula 3.9), in turn, are computed by a non-parametric k-NN estimation method (Tomppo 1991, 1996). The method utilises the distance metric  $d$ , defined in the feature space of the satellite image data. The  $k$  nearest field plot pixels  $p_i$  (in terms of  $d$ ), i.e., pixels that cover the centre of a field plot  $i \in F$ , are sought for each pixel  $p$  under the forestry land mask of the cloud free satellite image area. A maximum *geographical* distance is usually set in both horizontal and vertical directions in order to avoid selecting the nearest plots (spectrally similar plots) from a region in which the response of image variables to field variables is not equal to that of the pixel under consideration. This is necessary due to the fact that the mapping from field data to spectral data is not a bijection in a large area. One reason for this is that the dependence structure between field variables and image variables may vary between the vegetation zones and also between image sub-areas. Further, stratification on the basis of soil information is also made for the same reason (Katila and Tomppo 2001). The feasible set of nearest neighbours for pixel  $p$  is thus

$$\{p_i \mid d_{p,p_i}^{(x,y)} \leq d_{\max}^{(x,y)}, d_{p,p_i}^z \leq d_{\max}^z, R(p_i) = R(p)\} \quad (3.8)$$

where  $d_{p,p_i}^{(x,y)}$  is the geographical horizontal distance from pixel  $p$  to pixel  $p_i$ ,  $d^z$  is the distance in the vertical direction,  $d_{\max}^{(x,y)}$  and  $d_{\max}^z$  are their maximum allowed values, and  $R(p)$  is the indicator function of land class, mineral soil/peatland soil if the calibration is employed for map error correction, and all land classes if stratification method is employed for map error correction (Subsection 3.2.5) (Tomppo 1990, 1991, 1996, 2006b; Katila and Tomppo 2001).

Denote the  $k$  nearest feasible field plots by  $i_1(p), \dots, i_k(p)$ . The weight  $w_{i,p}$  of field plot  $i$  to pixel  $p$  is defined as

$$w_{i,p} = \frac{1}{d_{p_i,p}^t} \Bigg/ \sum_{j \in \{i_1(p), \dots, i_k(p)\}} \frac{1}{d_{p_j,p}^t}, \text{ if and only if } i \in \{i_1(p), \dots, i_k(p)\} \quad (3.9)$$

$$= 0 \text{ otherwise.}$$

The distance weighting power  $t$  is a real number, usually  $t \in [0,2]$ . A small quantity, greater to zero, is added to  $d$  when  $d = 0$  and  $i \in \{i_1(p), \dots, i_k(p)\}$ . The distance metric  $d$  in the operative MS-NFI8 and in the areas of Forestry Centres Keski-Suomi and Pohjois-Savo in 1996 was

$$d_{p_j,p}^2 = \sum_{l=1}^{n_c} (f_{l,p_j} - f_{l,p})^2, \quad (3.10)$$

where

$$f_{l,p_j} = f_{l,p_j}^0 / \cos^r(\alpha) \quad (3.11)$$

is the normalised intensity value of the spectral band (or feature)  $l$ . The normalising is done on the basis of the slope and aspect variation,  $f_{l,p_j}^0$  is the original intensity of the spectral band  $l$ ,  $\alpha$  the angle between terrain normal and sun illumination,  $r$  the applied power due to non-Lambertian surface and  $n_c$  the number of spectral features (Tomppo 1992) (Subsection 3.1.2). Only original spectral bands with equal weights (=1) were employed in the old operative k-NN approach.

For computing forest parameter estimates for computation units, sums of field plot weights to pixels,  $w_{i,p}$  are calculated by computation units, for example, by municipalities, and by map stratum  $h$  over the pixels belonging to the unit  $u$ . An example of stratum is mineral soil forestry land. The weight of plot  $i$  in stratum  $h$  to computation unit  $u$  is denoted

$$c_{i,h,u} = \sum_{p \in u_h} w_{i,p}. \quad (3.12)$$

Reduced weight sums  $c_{i,h,u}^r$  are obtained from the Formula (3.12), if clouds or their shadows cover a part of the area of the computation unit  $u$ . The real weight sum for plot  $i$  is estimated by means of the formula

$$c_{i,h,u} = c_{i,h,u}^r \frac{\hat{A}_{h,u}}{\hat{A}_{h,u}^r} \quad (3.13)$$

where

$\hat{A}_{h,u}$  = the estimate of the area of the forestry land of unit  $u$  on map stratum  $h$ , and



$\hat{A}_{h,u}^r$  = the estimate of the area of the forestry land of unit  $u$  on map stratum  $h$  not covered by the cloud mask.

The areas can be taken from digital maps. It is thus assumed that the forestry land covered by clouds per computation units is, on average, similar to the rest of the forestry land in unit  $u$  with respect to the forest variables (cf. Tomppo and Halme 2004).

The weights 3.12 and 3.13 are computed within forestry land separately for mineral soil stratum and peatland stratum. The weights are also computed to other land classes, arable land, built-up land, roads and waters if the stratification based map correction method is employed (Katila and Tomppo 2002). These weights are also required for the other map correction method, which is based on statistical calibration and a confusion matrix, when reducing the effect of the map errors on the estimates (Katila et al. 2000).

After the final field plot weights to computation units ( $c_{i,h,u}$ ) have been calculated, the ratio estimation is employed to obtain the small-area estimates (e.g., Cochran 1977). In this way, the estimation is similar to that using field plot data only. Volume estimates, e.g., are computed by computation unit  $u$  and timber assortment (log product)  $s$  in the following way. The mean volume  $v_{l,s}$  of the log product  $s$  for field data based sub-class  $l$  are estimated by the formula

$$\hat{v}_{l,s} = \frac{\sum_h \sum_{i \in I_{lh}} c_{i,h,u} v_{i,h,s}}{\sum_h \sum_{i \in I_{lh}} c_{i,h,u}} \quad (3.14)$$

where  $v_{i,h,s}$  is the volume per hectare of timber assortment  $s$  for plot  $i$  for the part belonging to sub-class  $l$  in field data and map stratum  $h$  and  $I_{l,h}$  the set of field plots belonging to field sub-class  $l$  and map stratum  $h$ . The corresponding total volumes are obtained by replacing the denominator in Formula (3.14) by 1. Biomass estimates for energy wood were calculated in a similar way.

More precisely, the weight  $w_{i,p}$  of the plot  $i$  is shared between the (possible) plot parts in the proportions of the estimated areas of the plot parts. The total weight of a field plot part  $i_l$  (belonging to map stratum  $h$ ),  $i \in I_{l,h}$ , to land class (or forestry land subclass)  $l$  for municipality  $U$  is therefore

$$c_{i_l,h,u} = a a_{i_l} \sum_{p \in u_h} w_{i,p} \quad (3.15)$$

where  $a$  is the area of a pixel and  $a_{i_l}$  is the share of field plot  $i$  belonging to field land class (or forestry land subclass)  $l$  with

$$\sum_l a_{i_l} = 1.$$

Mean and total volume increments could be similarly estimated. However, the increments predicted for tally trees are average increments by computation strata,

i.e., by tree species, diameter class and site factor classes over increment computation regions. These regions are usually so large that the within-region variation in growth factors is high, the constant predictions do not therefore correspond to the real variation between the MS-NFI computation units (municipalities). The increment estimates are therefore not usually made in MS-NFI.

Predictions of some (optional) forest variables are written in the form of a digital map during the procedure. The land classes outside forestry land are transferred to map form predictions directly from the digital map file. Within forestry land, the variables are predicted by the weighted averages of the  $k$  nearest neighbours (Tomppo 1991, 1996).

A pixel-level prediction  $\tilde{y}_p$ , of variable  $Y$  for pixel  $p$  is defined as

$$\tilde{y}_p = \sum_{i \in I_h} w_{i,p} y_i, \tag{3.16}$$

where  $y_i$  is the value of the variable  $Y$  on plot  $i$ . Figure 3.4 demonstrates the basic principle of k-NN method for map production with  $k=2$ .

The mode or median value is used instead of the weighted average for categorical variables. The predicted variables are usually land class, site fertility class, stand age, mean diameter of stand, mean height of stand, and volumes by tree species (pine, spruce, birch, other broad leaved trees) and by timber assortment classes. The total number of the maps is therefore over 20. An example of an output map from MS-NFI9 is shown in Fig. 3.2c.

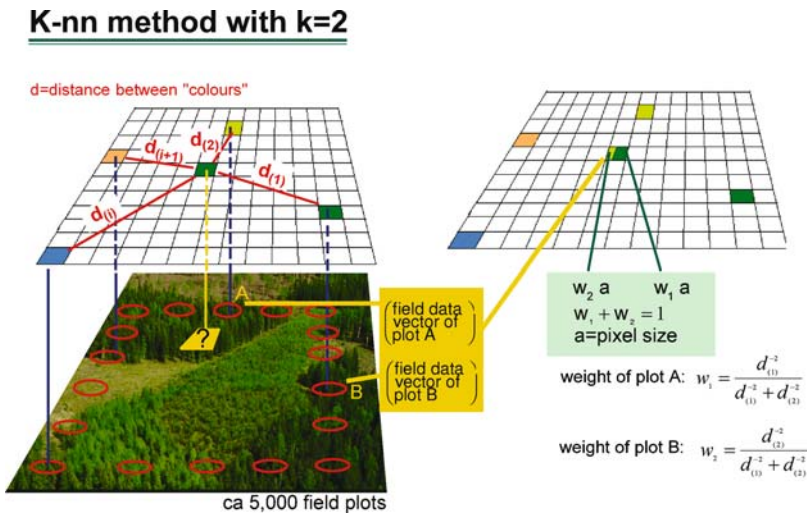


Fig. 3.4 A simplified demonstration of the k-nn method with  $k = 2$ .

### 3.2.3 *The Improved k-NN (ik-NN) Method, Use of Coarse Scale Forest Variable Estimates and Genetic Algorithm in the Distance Metric*

One of the main problems in practical applications of the k-NN method is how to select the sub-area and sub-set of the field plots from which the potential nearest neighbours are sought for each pixel. Another problem is the selection of the spectral features of the distance metric employed in order to obtain the smallest possible errors.

These problems were studied by Tomppo and Halme (2004) who introduced an improved k-NN method (ik-NN). The method is now summarised.

The overall aim of the ik-NN method is to minimize the errors of the predictions of the multi-source inventory. The goal was to reduce the errors both at the pixel level, and particularly, at the larger area level (from several tens of thousands of hectares up to several millions of hectares).

Two modifications of the k-NN estimation method were introduced:

1. The use of supplementary ancillary variables in addition to spectral data in selecting neighbours.
2. The use of 'optimal' weights for both the image features and ancillary information. A vector consisting of these elements is called a vector of explanatory variable weights and denoted by  $\omega$ . A method was developed to utilise ancillary data and to find the optimal explanatory variable weights.

As for the first modification, to restrict the complexity of the problem, a few core variables were selected and the estimates of these variables were studied. The volumes by tree species were selected as the variables. Tests with age-class distributions and also earlier experiments showed that the errors of the predictions of other variables are reduced when the errors of the predictions of volumes by tree species are reduced (Tomppo et al. 1998b).

The optimization was carried out solely at the pixel level. It was hoped, and later checked, that larger area errors decreased with the optimized weights. This was considered to be the ultimate check of goodness of the procedure.

A weighted sum of pixel level biases and root mean square errors (RMSE) of the predictions of some key variables was selected as the objective function. The weights are called fitness function weights and weight vector denoted by  $\gamma$  (Formula 3.17). The key variables employed were selected in such a way that they indicate also the coarse scale variation of the other important variables and were: (1) total volume, (2) volume of pine, (3) volume of spruce, (4) volume of birch and (5) volume of other broad leaved tree species. The biases and RMSEs of these variables have also been used in the operative applications of the method. The fitness (objective) function to be minimized with respect to  $\omega$  is:

$$f(\omega, \gamma, \hat{\delta}, \hat{e}) = \sum_{j=1}^{n_e} \gamma_j \hat{\sigma}_j(\omega) + \sum_{j=1}^{n_e} \gamma_{j+n_e} \hat{e}_j(\omega) \quad (3.17)$$

where  $\gamma > 0$  are user defined coefficients for pixel level standard errors  $\hat{\sigma}_j$  and biases  $\hat{e}_j$  for forest variable  $j$ ,  $n_e$  the number of the coarse scale variables and  $\omega$  is the weight vector to be estimated (Formula 3.18). Denote the feasible set of weight vectors by  $W$ .

The pixel-level errors and biases of multi-source inventory (k-NN) estimates are

$$\hat{\sigma}_m = \sqrt{\frac{\sum_{i \in F} (\hat{y}_i - y_i)^2}{n_F}} \quad \text{and bias} \quad \hat{e} = \frac{\sum_{i \in F} (\hat{y}_i - y_i)}{n_F}$$

where  $y_i$  is the observed value of the variable to be estimated (e.g., total volume),  $\hat{y}_i$  its estimate on the plot  $i$  and  $n_F$  the number of the field plots.

The fitness function weights, bias weights and RMSE weights, were experimentally given values and then fixed. This weighted sum was the criterion in the search for good weight vectors for image features and ancillary information.

The computation of the large-area predictions of the forest variables for even one weight vector is an extremely computer intensive task. The pixel-level objective function (Formula 3.17) has to be considered as a proxy for the real objective, which is a major source of imprecision in the optimization process. Other sources of imprecision are the choices of variables and fitness function weights and the non-optimality of the optimization result.

Note that the explanatory variable weights ( $\omega$ ) are sought in such a way that the prediction of the selected variables, in this case volumes, is optimized. Note also that the Landsat pixel measures information from an area that is larger than the size of a field plot (e.g., Halme and Tomppo 2001). This discrepancy is interpreted as a measurement error: a large one in the case of satellite images. It was decided to seek the weight vector using only field plots sufficiently far from the nearest stand boundary or land class boundary to reduce this error. A minimum distance of 20m was used. A further source of error is the location of a field plot with respect to the satellite image pixel, which also motivates this decision. It is important to note that the final large-area and municipality-group level estimates and error validation are calculated in operative applications using *all NFI field plots* and weights obtained from optimization with plots with at least 20m apart from the nearest stand boundary.

The predictions and their standard errors computed from field data only are employed in validating all multi-source predictions in areas ranging from several hundreds of thousand hectares to several million hectares. This is due to the fact that multi-source error estimation for areas larger than a pixel (field plot) is complicated and the solution is yet to be found. Satisfactory predictions for groups of municipalities (at the level of several hundreds of thousand hectares) and at a pixel level are assumed to be satisfactory also at the level of a few thousand and some tens of thousands of hectares.

A new distance metric was proposed in Tomppo and Halme (2004). Two types of new elements of the distance vector were introduced (1) the transformations of the spectral bands, (2) the coarse scale forest variable predictions of some key forest variables (Formula 3.18), called also the ancillary variables. All possible ratios of spectral bands were used. It was hoped that band ratios would better distinguish

between different tree species, e.g., pine and spruce, than the original bands. The use of large-area forest variables as additional elements direct the selection of the nearest neighbours to forests similar to the target pixel (cf. Fig. 2.12). All elements were finally weighted. The employed distance metric was thus (and has also been in the operative MS-NFI)

$$d_{p_j,p}^2 = \sum_{l=1}^{n_f} \omega_{l,f}^2 (f_{l,p_j} - f_{l,p})^2 + \sum_{l=1}^{n_g} \omega_{l,g}^2 (g_{l,p_j} - g_{l,p})^2 \quad (3.18)$$

where  $f_{l,p}$  is the  $l$ th image variable,  $g_{l,p}$  the large area prediction of the  $l^{\text{th}}$  applied forest variable,

- $n_f$  the number of image variables (or features),
- $n_g$  the number of coarse scale forest variables and
- $\omega_f$  and  $\omega_g$  the weight vectors for image features and coarse scale forest variables respectively.

A pixel size of  $1 \times 1$  km is used in the coarse scale forest variable predictions  $g_{l,p}$ . (Note the different pixel size for large area forest variables and satellite image data.) The values of the elements of the weight vector to be estimated are derived from optimization employing a genetic algorithm as given below. The first phase of ik-NN is to run the optimization algorithm, in the applications possibly by strata, e.g., mineral soil stratum and mire and bog stratum. The estimation after that returns to the basic k-NN estimation.

### 3.2.3.1 Simplified Sketch of the Genetic Algorithm

A genetic type algorithm was selected due to the complexity of the optimization problem and because the optimization problem may have several local optima. The method noticeably reduces the errors both at the pixel level and over areas of some thousand square kilometres, as well as in larger areas.

Genetic algorithms that imitate the behaviour of genes are currently used to solve difficult optimization problems such as combinatorial problems, but they are also popular for modelling economic and ecologic phenomena and machine learning (see e.g. Mitchell 1996). Genetic algorithms often produce good results for problems that are hard to solve. Normally, they also require a considerable amount of adjustment to fit the algorithm in the problem.

The following outline of the algorithm serves two purposes: it illustrates the principles of a genetic algorithm in general and, moreover, the version presented is similar to the genetic algorithm employed in MS-NFI9. For more information about the genetic algorithm schemes (see e.g., Mitchell 1996; see also Tomppo and Halme 2004).

The elements and operators of genetic algorithms originate from biology. The candidate solution vector is called a chromosome and its goodness is called its fitness. A group of chromosomes is called a population. One population is one generation. The operators are: selection of chromosomes (the criterion being their fitness), the

crossover of chromosomes producing new offspring and the random mutation of new offspring.

The following presentation does not include all features of the algorithm employed in MS-NFI9. A more detailed version is presented in Tomppo and Halme (2004). In a genetic algorithm, the value of the objective function for a trial solution is called the solution's fitness value.

The key parameters of the algorithm are:

$n_{gen}$  = number of generations

$n_{pop}$  = number of weight vectors in one population and number of vectors in the medipopulation (does not have to be the same)

$p_u$  = probability used in uniform crossover

$p_c$  = probability of accepting an inferior solution created by mutation

$p_m$  = mutation probability

$p_{rm}$  = radical mutation probability

$p_{i1}$  = probability 1 in selection

$p_{i2}$  = probability 2 in selection

The definitions of the parameters are given in the following simplified sketch (from Tomppo and Halme 2004).

#### 1. Initialisation.

Generate the initial population with  $n_{pop}$  random weight vectors. Calculate their fitness values (3.17). Set the generation count to 1.

#### 2. Selection.

In this step, a medipopulation (an intermediate group of weight vectors between two populations) is formed. Choose from the population two weight vectors (e.g., randomly or successive at some points) the fitness values of which are compared. Only the more fit one is chosen to be a member of the medipopulation with a probability  $p_{i1}$ . Only the less fit one is chosen to be member with probability  $1 - p_{i1} - p_{i2}$ . They are both members with probability  $p_{i2}$ . Repeat until the medipopulation consists of  $n_{pop}$  vectors. Note that several copies of vectors may occur.

#### 3. Crossover.

In this step, a new population is formed. With two successive vectors of the medipopulation  $\mathbf{a}$  and  $\mathbf{b}$  (parent vectors) carry out uniform crossover to produce two offspring  $\mathbf{c}$  and  $\mathbf{d}$ . That means with probability  $p_u$  the  $k^{\text{th}}$  element ( $k = 1, \dots, n$ ) of  $\mathbf{c}$  ( $\mathbf{d}$ ) comes from  $\mathbf{a}$  ( $\mathbf{b}$ ) and  $(1 - p_u)$  from  $\mathbf{b}$  ( $\mathbf{a}$ ); Pick the vector having the best fitness in the set, consisting of both offspring and parents, to be member of the next population. Repeat until the population consists of  $n_{pop}$  vectors. Increase the generation count by 1. If the count is equal to  $n_{gen}$  stop.

#### 4. Mutation.

In this step, the weight vectors in the new population are possibly mutated. In each vector of the population, each element is mutated with a probability  $p_m$ . Two kinds of mutations can occur: radical (probability  $p_{rm}$ ) (the element is subtracted from 1) or nonradical (the element is changed by  $\pm 20\%$ ). The mutated vector replaces the original vector as a member of the population if its fitness is better than the original vector's. If its fitness is less than that of the original vector, it replaces the original vector as a member of the next population with probability

$p_c$  and with probability  $1 - p_c$  the original vector remains a member of the population. Go to 2. An element changes by  $-20\%$  if nonradical mutation takes place. This percentage was observed to perform well.

### 3.2.3.2 The Application of the Algorithm

The practical solutions in applying the genetic algorithm are now described. The optimization problem to be solved is, which distance metric gives the lowest value for a linear combination of the RMSEs and biases. An ‘optimal’ weight vector for the elements of the distance metric has to be sought.

Fix in the following the vector  $\boldsymbol{\gamma} > 0$  (Formula 3.17). The objective function can therefore be denoted  $f(\boldsymbol{\omega}, \hat{\boldsymbol{\sigma}}, \hat{\boldsymbol{\varepsilon}})$ . The objective as a function of  $\boldsymbol{\omega}$  is not continuous.

After numerous experimental runs, upper bounds were introduced for the elements of the weight vector. This was because the objective seemed to be unexpectedly flat, providing a huge number of “equally good or almost equally good” solutions. No meaningful losses in the objective function optimal values were observed due to the bounds (Tomppo and Halme 2004, see Tables 2 and 3). The set of feasible weight vectors  $W$  fulfils thus the condition

$$W = \left\{ \boldsymbol{\omega} \in R_n^+, 0 \leq \omega_j \leq \text{uppe}_j, j = 1, \dots, n, \sum_{j=1}^n \omega_j = 1 \right\}, \text{ where } \text{uppe}_j = \text{upper bound}$$

for the weight for variable  $j$ .

The values of the vector  $\boldsymbol{\gamma}$  (Formula 3.17) were sought at the beginning and finally fixed at  $\boldsymbol{\gamma} = (0.3, 0.6, 0.6, 0.2, 0.1, 0.5, 1, 1, 0.2, 0.1)$ . The first five elements are the coefficients of the estimates of the standard errors  $\hat{\sigma}_j$  and the rest are those of the estimates of the biases  $\hat{\varepsilon}_j$ , of volume of all tree species, volumes of pine, spruce, birch and other broad leaved tree species respectively cf. Formula (3.17). In the fitness function, the biases were given weights larger than the standard errors and the biases of pine and spruce were given especially large weights. The aim was to reduce the biases of the corresponding estimates both at pixel level and for large areas because of the problems in distinguishing between pine and spruce volumes in some areas.

The values of parameters that worked successfully, were:

$$\begin{aligned} n_{pop} &= 50 \\ n_{gen} &= 30-80 \\ p_u &= 0.75 \\ p_m &= 0.05 \\ p_{rm} &= 0.35 \\ p_c &= 0.5 \\ p_{i1} &= 0.95 \\ p_{i2} &= 0.03 \end{aligned}$$

These values seem to work well for all multi-source data sets and have been applied in the operative MS-NFI since the implementation of the method.

### 3.2.4 *Selecting Estimation Parameters and Their Values for k-NN*

The basic principle of k-NN estimation is straightforward. However, practice has shown that the predictions and estimation errors depend to a large extent on the core estimation parameters of the k-NN algorithm. These are:

1. the variables employed in the distance metric, spectral bands or their transformations, possible correction for variation in illumination angle of the pixel based on elevation variation (slope, aspect) (Tomppo 1996)
2. the distance metric (Tomppo and Halme 2004)
3. the value of  $k$  (Katila and Tomppo 2001)
4. the weights to be attached to the nearest neighbours, e.g., even weights or functions of the applied distance and powers (negative)
5. the variables applied in restricting the area from which the nearest neighbours are sought for a pixel, e.g., a geographical reference area (Katila and Tomppo 2001)
6. the use of additional information, e.g., large area variation of forest variables in the distance metric (Tomppo and Halme 2004)
7. the use of ancillary data in the estimation, e.g., for stratification.

The parameters and their values in MS-NFI9 are given in Table 3.1. The parameters are selected by image scene and the selection is documented. The criteria are the mean square error and bias of pixel level predictions using leave-one-out cross validation, and particularly, the difference between areal estimates based on (i) multi-source inventory and (ii) on the field data based estimates and their standard errors, see Subsection 3.2.1. The differences of the areal estimates are assessed in terms of standard error based on the field data plots (e.g., Katila and Tomppo 2002; Tomppo and Halme 2004). The values of the parameters usually vary by images depending, e.g., on imaging conditions, number of available field plots and variability of forests. The selections are not independent. A change in one parameter affects the ‘optimal value’ of the other parameter. More studies are needed to ‘optimize’ the values simultaneously.

**Table 3.1** Applied ik-NN and k-NN estimation parameters employed in MS-NFI9.

Parameter	Choice
Variables applied in the distance metric	Illumination corrected spectral values for satellite image bands (Landsat TM 1-5, 7; Landsat 7 ETM+ 1-7, Pan; IRS-1 D LISS 1-4) and large area forest variable estimates
Distance metric	Weighted Euclidean distance
Value of $k$	5–10
Weights attached to the nearest neighbours	Weights proportional to the inverse or inverse squared distance ( $t = 1$ or $2$ )
Restrictions for search of nearest neighbours	A maximum vertical (100m or more in Northern Finland) and horizontal reference area (HRA) (40–120km), since NFI9 large area forest variable maps are used to direct the NN selection, possibly with a HRA limit



### 3.2.5 Area and Volume Estimates – Stratification, Correction for Map Errors

In the multi-source estimation, numerical map data (see Section 2.3) are employed to decrease estimation errors. If the numerical map data would be error free, k-NN predictions (3.16) and the weights (3.12) and (3.13) could be calculated using pixels belonging to forestry land only. Forestry land consists of forest land, poorly productive forest land and unproductive forest land (Subsection 3.1.3). However, map data can be out-of-date and include location errors. Furthermore, the applied land class definitions of the map data do not correspond exactly to the definitions of NFI. Errors can also arise during the post-processing of map data, e.g. when rasterizing narrow map themes such as linear formations, to coarse-resolution raster images. Two methods have been introduced to reduce the effect of map errors on small-area multi-source forest resource estimates: a statistical calibration method (Katila et al. 2000) and k-NN estimation by strata (Katila and Tomppo 2002) (Fig. 3.5).

#### 3.2.5.1 Calibrated MS-NFI Estimators

The calibration method is based on the confusion matrix between land classes of the field sample plot data and the corresponding map information. The bias in the land class or other total cover estimates, obtained, e.g., from remote sensing or map data, can be corrected by means of the error probabilities expressed as a confusion matrix (Czaplewski and Catts 1992; Walsh and Burk 1993), assuming that the employed field sample are based on a statistical sampling design (Card 1982). Although the quality of the map data varies by regions and by map themes, it is often possible to define the areal map strata in such a way that each stratum is reasonably homogeneous

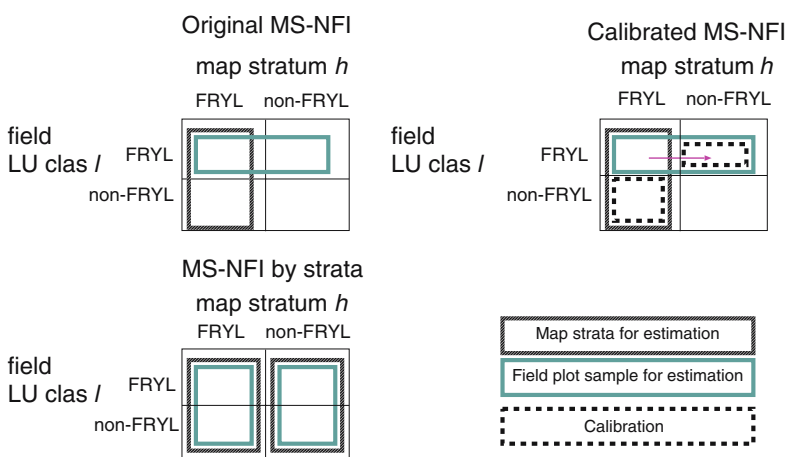


Fig. 3.5 Training data selection and map strata in the estimation in three different MS-NFI versions.

with respect to the map errors and the land class distribution. This enables the use of the synthetic small-area estimation method when correcting map errors (Rao 2003). The method utilises the error and land class proportions that have been estimated from a larger region. The stratification employed is given in Table 2.6. An inverse calibration method is used to correct for map errors in the MS-NFI small-area estimates utilising the field data from large area, e.g. forestry centre,  $R$  in which small area  $u$  belongs. The proportion of field data based land class  $l$  within each map stratum is first estimated by the corresponding plot count ratio:

$$\hat{P}_{h,l} = \frac{n_{h,l}}{n_h} \quad (3.19)$$

computed over the entire forestry centre (Table 3.2). Here,  $n_{h,l}$  is the number of field plots belonging to map strata  $h$  and land class  $l$ ,  $n_h$  is the number of field plots belonging to map strata  $h$ . The calibrated area estimator is obtained by summing the corresponding proportions of municipality level stratum areas:

$$A_{u,l}^* = \sum_h \hat{P}_{h,l} A_{u,h}, \quad (3.20)$$

where  $A_{u,h}$  is the area of map stratum  $h$  in a particular municipality  $u$ . The aggregate of small-area estimates over forestry centre  $R$  is equal to the unbiased post-stratification estimator (Katila et al. 2000; Katila 2006a).

Map errors, that is, errors in the areas of forestry land on map data, affect the MS-NFI estimates at the municipality level. The sum of field plot weights over a computation unit is equal to the area of forestry land based on map data (Subsection 3.2.2). The calibration of these weights for the map errors is not an easy task

**Table 3.2** Distribution of land classes among field plots by map strata in a subregion of Häme-Uusimaa forestry centre in Southern Finland (municipalities 398, 560, 98, 504, 18, 15, 611, 283, 401, 855, 83, 86, see Appendix 1).

Stratum (h)	Land class l											
	Forestry land		Arable		Roads				Water		Total	
	(%)	( $n_{h,l}$ )	(%)	( $n_{h,l}$ )	(%)	( $n_{h,l}$ )	(%)	( $n_{h,l}$ )	(%)	( $n_{h,l}$ )	(%)	( $n_{h,l}$ )
Forestry land	92.0	845	2.5	23	4.2	39	0.7	6	0.7	6	100.00	919
Arable	2.3	8	96.8	332	0.9	3	0.0	0	0.0	0	100.00	343
Buildings, urban	32.4	11	5.9	2	52.9	18	8.8	3	0.0	0	100.00	34
Roads	31.4	22	20.0	14	20.0	14	28.6	20	0.0	0	100.00	70
Other built-up	25.0	1	25.0	1	50.0	2	0.0	0	0.0	0	100.00	4
Water	0.0	0	0.0	0	1.0	1	0.0	0	99.0	95	100.00	96
Total	60.5	887	25.4	372	5.3	77	2.0	29	6.9	101	100.00	1,466

because non-forestry land field plots are not employed in the MS-NFI estimation procedures and because the map strata do not correspond exactly to the NFI land classes. A heuristically derived method for calibrating the field plot weights was proposed by Katila et al. (2000), in which the sum of the calibrated weights for computation unit  $u$  is equal to the calibrated forestry land area estimator  $A_{u,FRYL}^*$ .

There are two types of error attributable to map errors (Fig. 3.6). First, the effect on the estimates by pixels that are falsely classified as forestry land on the basis of the map data must be eliminated (type (i) error, Fig. 3.6). The contribution of each non-forestry land class  $l$  is estimated from the proportion given by the confusion matrix (Formula 3.19) and the area of the forestry land (FRYL) stratum is

$$\hat{P}_{FRYL,l} A_{u,FRYL} = \hat{P}_{FRYL,l} \sum_i c_{i,u}, \tag{3.21}$$

where  $c_{i,u}$  is the weight (area) of plot  $i$  to the FRYL stratum of computation unit  $u$  (Formula 3.12). There is no direct way to reliably estimate the field plot weights  $w_{i,p}$  for a forestry land stratum pixel  $p$  on map which pixel actually belongs to land class  $l$ . An assumption is made that the spectral vectors of those pixels are on the average similar to the spectral vectors of the pixels of those map strata which best represent NFI land class  $l$ , e.g., the spectral vectors of the pixels on the arable land map stratum are on the average similar to the spectral vector of the NFI arable land class. The union of the map strata that represents land class  $l$  is denoted by  $\mathbf{h}(l)$ . The pixel weights  $w_{i,p}$  of the field plots are calculated for all pixels  $p$  within these strata in the same way (using the  $k$ -NN technique) as for the pixels within the forestry

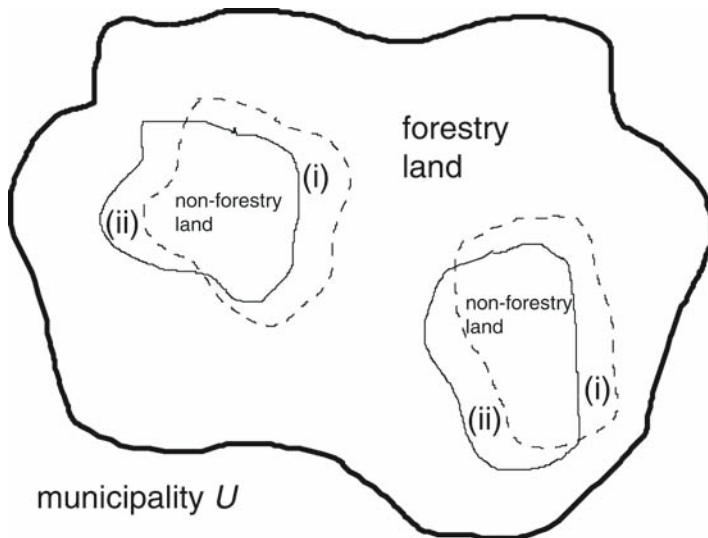


Fig. 3.6 Two types of map error in small-area estimates.

land stratum in the ordinary MS-NFI (Subsection 3.2.2). The average weight of a field plot on pixels whose actual land class is  $l$  is then estimated by

$$\bar{w}_{i,u_h(l)} = \frac{c_{i,u_h(l)}}{\sum_i c_{i,u_h(l)}}. \quad (3.22)$$

To account for map errors in the other direction (type (ii) error, Fig. 3.6), that is, for pixels in the non-forestry land map strata which actually belong to forestry land, it is assumed that in each computation unit they are on average similar to the pixels in the forestry land stratum of that unit. This requires the scaling up of the downward-calibrated weights by the area correction factor

$$A_{u,FRYL}^* / A_{u_{FRYL},FRYL}^* = \frac{\sum_h (\hat{P}_{h,FRYL} \sum_i c_{i,u_h(l)})}{\hat{P}_{FRYL,FRYL} \sum_i c_{i,u}} \quad (3.23)$$

where the nominator  $A_{u,FRYL}^*$  is the calibrated small-area estimate for FRYL and the denominator  $A_{u_{FRYL},FRYL}^*$  the calibrated FRYL area for the FRYL stratum alone. As a result, the calibrated weights are

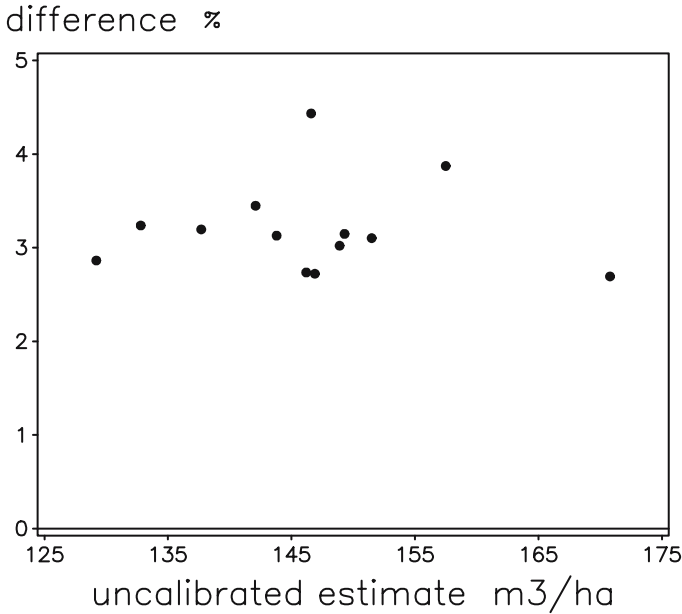
$$c_{i,u}^* = \frac{A_{u,FRYL}^*}{A_{u_{FRYL},FRYL}^*} \left( c_{i,u} - \sum_{l \neq FRYL} P_{FRYL,l} A_{u,FRYL} \bar{w}_{i,u_h(l)} \right). \quad (3.24)$$

It should be noted that although these weights add up to  $A_{u,FRYL}^*$ , non-negative values of an individual weight are not guaranteed.

The calibration typically increases the mean volume estimates and reduces the forestry land area estimates for small areas if forestry land is overrepresented on maps (Fig. 3.7).

### 3.2.5.2 Stratified MS-NFI

Despite the quite simple idea of the calibration method, it is rather laborious when employed in the operative MS-NFI. Another method, called stratified MS-NFI, has therefore been introduced to reduce the effect of inaccurate map data on the forest resource estimates (Katila and Tomppo 2001). In this method, the  $k$ -NN estimation is applied to each strata. Consequently, the  $k$ -NN parameters must be selected for each stratum separately, aiming at precise and unbiased predictions of forestry land area and total volume by strata. All the field plots within each map stratum, independently of the NFI land class, are employed in the  $k$ -NN estimation for the pixels of the particular stratum. In short, both field plot data and satellite image data are stratified for estimation on the basis of map data. The area estimation with pure field data utilises the information from the centre points of the field plots only,



**Fig. 3.7** Percent differences between calibrated and uncalibrated MS-NFI estimates for each municipality plotted against the uncalibrated estimates, mean volume ( $\text{m}^3/\text{ha}$ ), subregion of Häme-Uusimaa forestry centre in southern Finland.

while the volume estimation uses information from the whole plot (Tomppo 2006a). The MS-NFI utilises all parts of the plots, for both area and volume estimations. In the original and calibrated MS-NFI, only those field plots are used that completely fall within forestry land. The stratified MS-NFI method has the advantage of including all the sample plots within a stratum in the training data. In this sense it resembles the field inventory estimation.

The final estimates for the stratified MS-NFI are derived by combining the stratum-wise estimates using Equation 3.14.

The strata employed were formed so as to be as homogeneous as possible with respect to the NFI based land classes. However, the number of strata was restricted by the fact that there should be a sufficient number of field plots for the  $k$ -NN estimation (Table 3.3). The aim of the method was to obtain simultaneously the forestry land area estimate and accurate forest variable estimates within each stratum. The stratified MS-NFI is essentially a different estimation method compared to the calibrated MS-NFI in which the MS-NFI estimates are more or less calibrated systematically upwards or downwards (Katila and Tomppo 2001). The stratified MS-NFI results were more balanced than those from the calibrated MS-NFI in Katila and Tomppo (2001). However, in the operative MS-NFI9, the method that yielded the most accurate small-area results varied between regions.

**Table 3.3** Map stratification principally used in stratified  $k$ -NN estimation

Code (h)	Stratum
1	Forestry land, mineral soils
2	Forestry land, peatlands
3	Arable land
4	Built-up areas and roads
5	Water

### 3.2.5.3 Calibration of the MS-NFI Municipality Estimates to the Official Land Areas

The MS-NFI employs a 1:100,000 digital database for municipality boundaries, while the field inventory employs land and water areas from official statistics of the Finnish Land Survey (Suomen ... 2006). The area information from the latter data source is more accurate and slight differences between the total areas of municipalities from these two data sources have been discovered. Therefore, after the correction of map errors using calibration or stratified  $k$ -NN, the MS-NFI municipality land areas are calibrated to the official land areas. The calibration coefficient is straightforward  $A_{U, Land, NLS} / A_{U, Land}^*$  and this ratio is assumed to also hold for forestry land and the (calibrated or stratified) weights  $c_{i,U}$  are multiplied by this coefficient. For the calibrated MS-NFI, the calibrated land area  $A_{U, Land}^*$  must be first estimated using Formula 3.20. The calibration to the official land areas is valid only for (random) deviations between the two data sets and not for the case where real and significant boundary changes between municipalities have taken place in either of the two data source.

### 3.2.6 Assessing the Errors – Current and Potential Methods

This subsection summarises the current methods employed in assessing the reliability of the pixel level predictions and the estimates for a group of pixels. Some recent efforts to derive error estimators for an arbitrary group of pixels are also described. The error estimators are presented as examples of the approaches for potential operative error estimators although they are not yet employed in the operative Finnish MS-NFI. Deriving this type of error estimator has proven to be a challenging task. The problem can be divided into the derivation of (i) an error estimator for a pixel level prediction and (ii) an error estimator for a parameter for an area of interest.

Difficulties arise because:

1. Errors depend on the actual value of the variable to be predicted and so pixel-level errors are spatially dependent.
2. The variables measured or observed on the field plots are also spatially dependent.
3. The spectral values of adjacent pixels of a satellite image are dependent due to the atmospheric properties (scattering) and imaging technique.

Furthermore, several error sources make the error estimation complex, examples of such error sources are given in Chapter 5.

### 3.2.6.1 The Current Methods in Assessing the Reliability of the Results

To obtain an idea of the level of errors in the Finnish MS-NFI, the pixel-level root mean square error (RMSE) and the pixel level average bias using leave-one-out cross-validation (Subsection 3.2.3) are calculated. For a sufficiently large area consisting of a group of pixels, the MS-NFI estimates are compared to the estimates and error estimates based solely on field data (Subsection 3.2.1). Some empirical error estimates are also available for reliability assessments (Katila 2006b; Tomppo et al. 2008). Pixel-level error estimation is usually employed in the Finnish MS-NFI when selecting the estimation parameters for k-NN or ik-NN, as described in Subsection 3.2.4. Standard error estimates for groups of pixels are calculated as described in Subsection 3.2.1, see Formula (3.7).

### 3.2.6.2 Model-Based Error Estimation

Although that the pixel level RMSE has been estimated using leave-one-out cross-validation in many k-NN papers, it does not accommodate any of the dependencies listed above, and is not a direct measure of the standard error for a prediction (Kim and Tomppo 2006). Furthermore, if the variation of a variable on the field plots does not cover all the variation of the variable in an area of interest (AOI), the leave-one-out RMSE results in an underestimate for the pixel level error.

The direct statistical squared error estimate for an estimate  $\hat{M}$  of the parameter  $M$  is the mean square error (MSE)

$$E(\hat{M} - M)^2, \quad (3.25a)$$

and similarly for the prediction  $\tilde{y}(\mathbf{x}_i)$  of the variable  $y(\mathbf{x}_i)$  the MSE is

$$E(\tilde{y}(\mathbf{x}_i) - y(\mathbf{x}_i))^2. \quad (3.25b)$$

Accommodating the spatial dependencies into the estimators of (3.25a) and (3.25b) requires a model-based approach where the observed value  $y_i$  of pixel  $i$  is considered to be a realisation of a random variable. For example, it can be assumed that  $y_i$  is a realisation of the distribution of all possible realisations associated with the same covariate data vector,  $\mathbf{x}_i$ , e.g., satellite image data vector. The pixel level mean and variance of the distribution are denoted by  $\mu_i$  and  $\sigma_i^2$ , respectively. The realization,  $y_i$ , can be expressed as,

$$y_i = \mu_i + \varepsilon_i \quad (3.26)$$

where  $E(\varepsilon_i) = 0$ ,  $\text{Var}(\varepsilon_i) = \sigma_i^2$  (cf. McRoberts et al. 2007). Note that the deviations  $\varepsilon_i$  are spatially correlated.

### A Model-Based Error Estimation at a Pixel Level

When  $\hat{M}$  and  $\tilde{y}(\mathbf{x}_j)$  in (3.25) are unbiased estimators for  $M$  and  $y(\mathbf{x}_j)$  respectively, MSE's (3.25a) and (3.25b) are identical to the error variances, thus, e.g. (3.25b) is equal to

$$\text{Var}(\tilde{y}(\mathbf{x}_j) - y(\mathbf{x}_j)) \quad (3.27)$$

Kim and Tomppo (2006) proposed a model-based estimator for the error variance of the pixel-level predictions (3.16) when the weight  $w$  is the inverse of the squared Euclidean distance. The error variance was expressed as a function of the distances in the feature space and a variogram. An interesting detail of this approach is that the variance estimator was based on the variogram in the covariate space, e.g., satellite image feature space, not in the geographical space as often is the case. Let us denote the distance in the feature space from the target pixel  $o$  to pixel  $i$  by  $d_{oi}$ , i.e., distance (3.10) or (3.18), the variogram in the covariate space by  $\gamma$ , and the covariate vector associated to pixel  $i$  by  $\mathbf{x}_i$ . The variance (3.27) can then be presented as (Kim and Tomppo 2006)

$$\text{Var}(\tilde{y}(\mathbf{x}_o) - y(\mathbf{x}_o)) = -\sum_i \sum_j \left( \frac{d_{oi}^{-2}}{\sum_i d_{oi}^{-2}} \right) \left( \frac{d_{oj}^{-2}}{\sum_i d_{oi}^{-2}} \right) \gamma(\mathbf{x}_i - \mathbf{x}_j) + 2 \sum_i \left( \frac{d_{oi}^{-2}}{\sum_i d_{oi}^{-2}} \right) \gamma(\mathbf{x}_i - \mathbf{x}_o) \quad (3.28)$$

A Matérn class model (Matérn 1960) was used to estimate a parametric model for the variogram, and was fitted to the prediction residuals.

In the application, the first two principal components of the covariance matrix of six Landsat 5TM spectral bands were employed to predict volume and to estimate the variogram model-based error. A cubic root transformation was used to stabilize the heteroscedasticity of the residuals. The data was stratified on the basis of mineral soil and peatland due to the fact that the spectral responses are very different for those two land classes. In a validation trial, the method produced similar error estimates to the empirical method when splitting the data into modelling (two thirds) and validation (one third) parts.

### A Model-Based Error Estimator for an Arbitrary Group of Pixels

Some examples of the error estimators for an arbitrary group of pixels are reviewed next, in a more detailed way, the approach by McRoberts et al. (2007). It is also a model-based method, starting from the model (3.26), and utilises a variogram model to accommodate the spatial dependencies of the residuals. Otherwise than Kim and Tomppo (2006), a variogram model in the geographical space was employed.



Let us use the notations of the model (3.26) and furthermore  $Cov(\varepsilon_i, \varepsilon_j) = \rho_{ij} \sigma_i \sigma_j$ , where  $\rho$  denotes the spatial correlation of  $\varepsilon$ . McRoberts et al. (2007) used an unweighted mean of the values of the variables as the k-NN prediction

$$\tilde{y}_i = \frac{1}{k} \left( \sum_{j=1}^k y_j^i \right), \quad (3.29)$$

where the set  $\{y_j^i: j \in \{i_1(p), \dots, i_k(p)\}\}$  consists of the observations for  $k$  pixels in the reference set nearest to the  $i^{\text{th}}$  pixel in the covariate space with respect to the distance metric employed (e.g., Formula (3.10) or Formula (3.18), Subsection 3.2.3).

The following notations were used and the following assumptions were made.

1. An approximate symmetry among the nearest neighbours around  $x_i$  in the covariate space.
2.  $\mu_j^i \approx \mu_i$  where  $\mu_i$  is the superpopulation mean corresponding to  $x_i$  and  $\mu_j^i$  is the superpopulation mean of the distribution of which  $y_j^i$  is a realization.

These assumptions guarantee unbiasedness of the individual predictors and estimators both at pixel level and at the level of aggregates of pixels, i.e., e.g.,  $E(\tilde{y}_i) \approx \mu_i$ . Furthermore, the k-NN prediction  $\tilde{y}_i$  was employed as both the estimator of the mean,  $\mu_i$  and the realization,  $y_i$ ; i.e.,  $\hat{\mu}_i = \hat{y}_i = \tilde{y}_i$ .

The estimator of the variance of the prediction of a realization,  $y_i$  was expressed as a function of  $\sigma_i^2$  and the estimator for  $\sigma_i^2$  was expressed using the variation between the prediction and the values of the k-nearest neighbour plots taking into account spatial correlation among the realisations  $y_j$  which leads to

$$\sigma_i^2 = \frac{\sum_{j=1}^k (y_j^i - \tilde{y}_i)^2}{k - \frac{1}{k} \sum_{j_1=1}^k \sum_{j_2=1}^k \rho_{j_1 j_2}}. \quad (3.30)$$

This estimator depends on the unknown  $\rho_{ij}$ . Its estimator was derived using the connection of variogram and correlation,  $\rho_{ij} = 1 - (\gamma(d_{ij}) / \gamma_{\text{total}})$ , as well as the empirical

semivariogram  $\hat{\gamma}(d) = \frac{1}{2 \|\mathcal{N}(d)\|} \sum_{(d)} (\hat{\delta}_i - \hat{\delta}_j)^2$ , where the quantities  $\hat{\delta}$  are standardised residuals. An iterative approach that iterated between (3.28) and  $\hat{\rho}_{ij}$  and  $\hat{\gamma}_{ij}$  was used to estimate  $\hat{\sigma}_i$ .

Following a model-based approach, McRoberts et al. (2007) also presented a variance estimator for the predictions of a realisation,  $y_i$ , in addition to variance of  $\hat{\mu}$ . It was shown that the variance of the estimator  $\hat{y}_i$  can be expressed as

$$\text{Var}(\hat{y}_i) \approx \frac{\sigma_i^2}{k^2} \left( \sum_{l_1=1}^k \sum_{l_2=1}^k \rho_{l_1 l_2} - 2k \sum_{l=1}^k \rho_{li} + k^2 \right) \quad (3.31)$$

where  $l$ ,  $l_1$ , and  $l_2$  index the  $k$  neighbours nearest to the  $i^{\text{th}}$  pixel (McRoberts et al. 2007).

The variance of the estimators concerning a group of pixels were also derived both for superpopulation means,  $\bar{Y}_{M1} = \frac{1}{N} \sum_{i=1}^N \hat{\mu}_i$ , and the mean over predictions of realisations from the superpopulation,  $\bar{Y}_{M2} = \frac{1}{N} \sum_{i=1}^N \hat{y}_i$ . The variances of these estimators were derived in a straightforward way from (3.30) and (3.31), for the details, see McRoberts et al. (2007).

The study of McRoberts et al. (2007) is a promising approach to solve the famous problem. Some issues remained and were listed by the authors. Some assumptions were made in deriving the variance estimators. For example, the superpopulation means of the neighbours was assumed to be same as that of the target pixel which, together with the zero-expectation of the deviations  $\varepsilon$  of the realisations  $y_i$  from the population mean  $\mu_i$ , symmetry of the distribution of neighbours in covariate space, and adequacy of the range of reference set observations in covariate space, guarantee unbiasedness. In addition, neither the effect of the selection of  $k$  on variances nor the effect of weighting individual neighbours when calculating  $k$ -NN predictions were investigated.

A model-based estimator of the uncertainty of  $k_{nn}$  predictions was also proposed by Magnussen et al. (2007). It has some features common to McRoberts et al. (2007) but differs in many others. One difference is that it also tries to handle a possible bias of the estimators. The starting assumption was same as in McRoberts et al. (2007). For a given unit, i.e. pixel  $i$ , with covariate data vector  $\mathbf{x}_i$  (e.g., satellite image data), the value of the associated variable  $Y$  is assumed to be a random realization  $y_i$  from a superpopulation with a fixed superpopulation mean  $\mu_i$  and a variance  $\sigma_i$ .

The error estimators were derived in a different way than in McRoberts et al. (2007). The prediction  $\hat{y}_i$  was based on the  $k$ -NN method. However, unlike in McRoberts et al. (2007), distance weighting was used. The differences in error estimation are: (i) the expected values of  $Y$ ,  $\mu_i$ , is estimated by a non-parametric regression expressing  $\mathbf{x}$  as a univariate variable, denoted by  $X^*$ ; (ii) the variance  $\sigma_i$ , the expected variance of  $Y$  given  $X^*$ , is estimated by modelling the difference of observed  $y_i$  and the estimate of  $\mu_i$  (from (i)) by means of a non-linear relationship between the difference and  $X^*$  (iii) the correlation introduced by the distance ordering and weighting of the  $k$  reference  $y$ -values is used in a  $k$ -NN prediction and in estimating the variance of the prediction  $\hat{y}_i$ , and (iv) an estimate of bias of a  $k$ -NN prediction of an expected  $Y$ -value is also provided.

Other approaches to the derivation of the error estimate for an arbitrary group of pixels, not necessarily using  $k$ -NN estimation, include the variogram model applied by Lappi (2001) for a calibration estimator, a subsampling method for nonstationary spatial data by Ekström and Sjöstedt-de Luna (2004) and the design based approach by Baffetta (2008) for  $k$ -NN estimation. Lappi (2001) also used a model-based approach and derived a calibration estimator for the predicted average value,  $\bar{Y}_{M2}$  (McRoberts et al. 2007) while the error variance of the calibration estimator for the predicted average was derived using a variogram model.

# Chapter 4

## Results

**Abstract** In this chapter MS-NFI9 estimates are presented by municipalities. The estimates based on field data only together with their standard errors are given for land class estimates and for volume estimates by tree species. The purpose of these massive tables and numerous figures is to demonstrate to MS-NFI products in a concrete way and help a reader to understand the possibilities of MS-NFI. The MS-NFI9 estimates are compared to the MS-NFI8 estimates by regions and differences are discussed. Estimates of forest biofuel potentials in young thinning stands and mature forests are also discussed with the examples from two development classes. Current and new methods for error estimation are presented. Thematic output maps are presented and described.

**Keywords** Multi-source forest inventory, forest resource estimates, area estimates, volume estimates, thematic maps

### 4.1 Forest Resources by Municipalities

The primary purpose of MS-NFI is to be able to calculate forest resource estimates for municipalities. Two other calculation units, in addition to a pixel, have been employed to justify the selected estimation parameters and to obtain some idea of the reliability of the estimates. These units are a group of municipalities and a forestry centre. The MS-NFI method makes it possible to estimate all parameters derived from the field variables. In Appendix 1, Tables 1–8, estimates are presented for those parameters of which the estimates are considered to be sufficiently precise. Some of the estimates in the tables are also available via Internet (Metinfo 2007). The municipality level aggregates of MS-NFI estimates at forestry centre level (regions) were compared to field estimates to analyse possible significant systematic errors, i.e., biases. The field inventory estimates and their standard errors (SE) for forestry centres are presented for areas of land classes, as well as mean and total volume by tree species (Appendix 1, Tables 1, 6 and 7). This validation was carried out also for sub-regions, groups of municipalities, during the

operative MS-NFI9, particularly for land classes and volumes by tree species in order to find good enough estimation parameters.

The MS-NFI area estimates of the forest land, poorly productive forest and unproductive forest were unbiased, i.e. the MS-NFI estimates were within two SE of the field inventory estimates, for majority of forestry centres (Appendix 1, Table 1). The combined forestry land area estimates were within one SE of the field inventory estimates except in one case. The applied map data was more accurate and up-to-date in MS-NFI9 than in MS-NFI8 (Tomppo et al. 1998b). The impact of the map errors on the estimates were corrected by two optional methods (Subsection 3.2.5). However, the calibration method employed has shown a tendency to diminish the plot weights of poorly productive forest land (PPF) and especially those of unproductive forest land. Consequently, the area estimates of these variables from MS-NFI9 were typically smaller than those based on the field plot data only and significantly biased in forestry centres 0, 1 and 9 on unproductive forest land. Stratified MS-NFI was used in forestry centres 2 and 11. Distinguishing between forest land and PPF and unproductive forest land is difficult when employing satellite image data. It is, of course also difficult in the field. In such classification situations, the proportions (of land classes) obtained may be close to the average proportions in the training data.

The aggregates of MS-NFI estimates of mean volume of growing stock by tree species on forest land and FPPF were in most cases unbiased, except for other deciduous tree species (Appendix 1, Tables 6a and 7a). It seems to be difficult to separate birch and other deciduous species by means of multi-source inventory. Similar results were obtained in validating the total volume estimates (Appendix 1, Tables 6b and 7b).

## **4.2 Comparison of the Results by Regions and to MS-NFI8 Results**

### ***4.2.1 Variables in the Comparison***

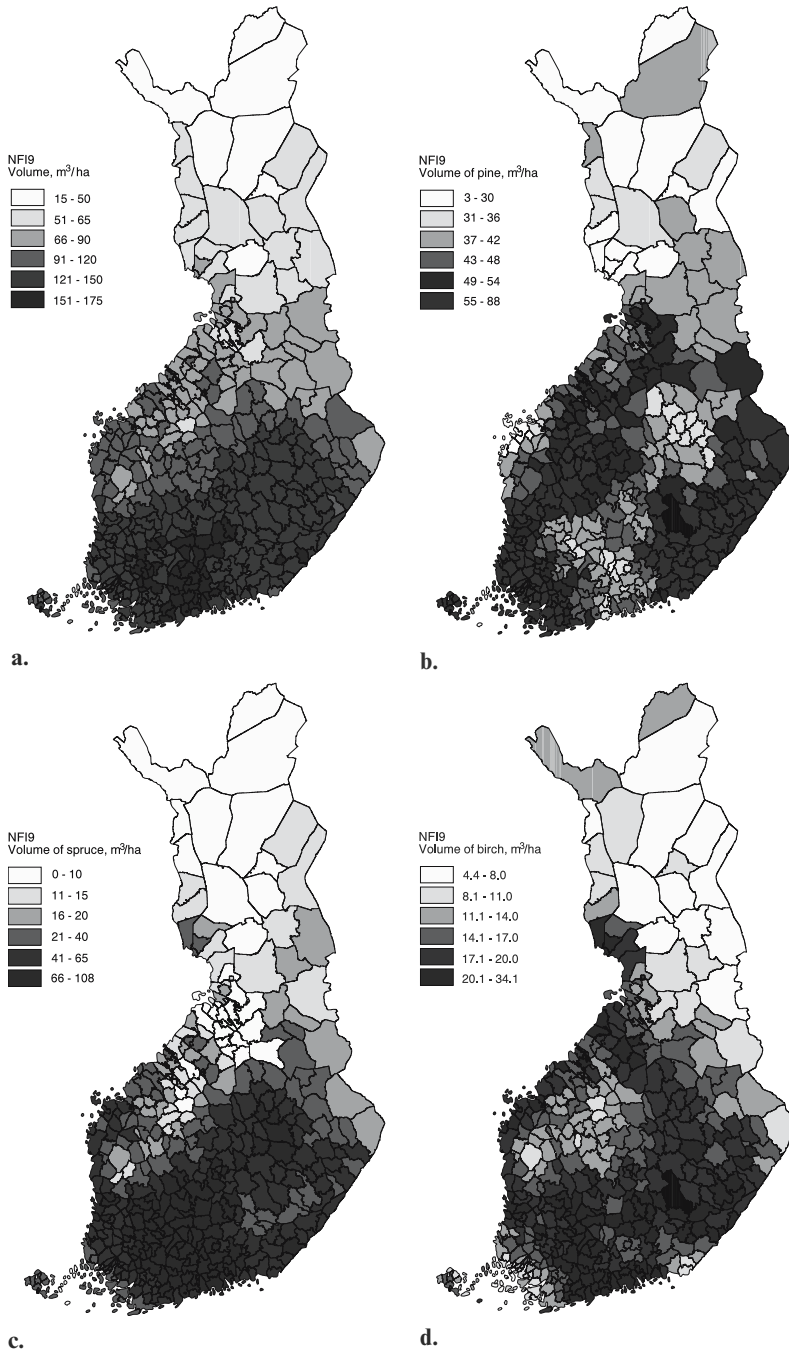
The forest resource estimates are calculated for municipalities and forestry centres. The comparison between municipalities and regions focuses on some core variables. The areas of municipalities vary considerably and so it is more appropriate to compare average values and proportions (%). The results for the municipalities are only averages and tell little about between-stand variation within a municipality. Forestry and forest land areas in most municipalities amount to several hundreds of square kilometres but stands are only a few hectares. There can be large variations within municipalities but the variation between municipalities resembles a large area phenomenon rather than a feature of a small area (Tomppo et al. 1998b).

### 4.2.2 Mean Volume of Growing Stock

The mean volumes of growing stock by tree species are presented in Fig. 4.1. The mean and total volumes by tree species and roundwood assortments are presented in Appendix 1. Tables 6a and 6b present the volumes for forest and poorly productive forest land (FPPF) and Tables 7a and 7b give the volumes for forest land. Appendix 1, Table 2b, presents mean volumes on mineral soils and peatland soils both for forest land and for combined FPPF. The mean volume of growing stock by age classes is presented in Appendix 1, Table 4b and by development classes in Appendix 1, Table 5b. The standard errors (SEs) of the field inventory for the forestry centres are shown in Appendix 1, Tables 6a, 6b, 7a, and 7b. In most cases, the MS-NFI estimates of mean and total volumes by tree species in the forestry centres were within two SE from field inventory estimates. One of the main objectives of the MS-NFI estimation was to obtain unbiased volume estimates for the main tree species groups. The bias was assessed at the level of a group of municipalities using field data based estimates and their SEs. In many forestry centres, the volume of other deciduous tree species was underestimated. The birch and spruce volumes also tend to be underestimated in many forestry centres.

Overall patterns of mean volumes of growing stock and mean volumes by tree species follow the patterns of growth factors. Intensive forestry with forest regeneration that favours pine in the regeneration has increased the mean volume of pine in throughout the country since the 1960s (e.g., Tomppo et al. 2001). The mean volume of spruce is relatively high in regions with high growth factors, which implies a high overall mean volume. Peatland drainage has increased the volume of birch in regions with high proportions of peatland. Favouring birch as a mixture in coniferous forests has also increased throughout most of the country. Patterns of mean volumes and mean volumes by tree species follow those obtained using field data only and kriging smoothing (Tomppo et al. 2007). MS-NFI makes it possible to calculate more precise municipality level estimates than field data only and kriging.

The mean volumes of the growing stock in the municipalities vary quite a lot between forestry centres. Table 4.1 summarises the number of municipalities by forestry centre on the basis of mean volume of growing stock on forest land. The areas of forest land in the volume classes are also given. The mean volumes on forest land are somewhat higher than those on FPPF, especially in the northern Finland where the area of PPF is relatively large (Appendix 1, Tables 1, 6a, 7a). The highest mean volume of growing stock on FPPF was in Häme-Uusimaa forestry centre, 153 m<sup>3</sup>/ha, and the lowest in Lapland, 49 m<sup>3</sup>/ha (Appendix 1, Table 6a). Furthermore, the mean volume often exceeded 120 m<sup>3</sup>/ha in the southern parts of Finland and there were 19 municipalities where the mean volume of growing stock exceeded 160 m<sup>3</sup>/ha. Most of these municipalities are located in Häme-Uusimaa forestry centre and some in the southernmost centres of Etelärannikko and Lounais-Suomi and also Pirkanmaa (Fig. 4.1a). The highest mean volumes among the municipalities were in Hauho, 175, Ypäjä 170 m<sup>3</sup>/ha, and Mäntsälä, 169 m<sup>3</sup>/ha, all of them in



**Fig. 4.1** The mean volume of growing stock on forest and poorly productive forest land by municipalities: all tree species (a), pine (b), spruce (c), birch (d), other deciduous species (e). Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

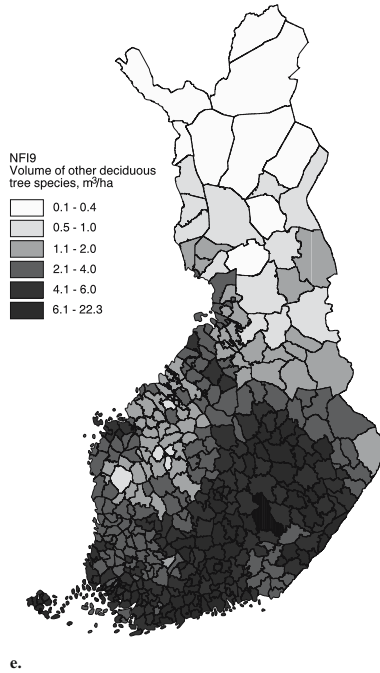


Fig. 4.1 (continued)

Häme-Uusimaa forestry centre. In southern Finland, the lowest mean volumes are in Brändö in Åland and Perho in Etelä-Pohjanmaa (62 m<sup>3</sup>/ha). In Etelä-Pohjanmaa forestry centre, the mean volume was 88 m<sup>3</sup>/ha and in Pohjanmaan rannikko, Pohjois-Karjala and Åland forestry centres the mean volume was slightly over 100 m<sup>3</sup>/ha. In these four forestry centres the highest mean volumes were in Jomala, Outokumpu and Rääkkylä (approximately 130 m<sup>3</sup>/ha). Growth factors, such as degree days during the growing season and site fertility distributions explain the greater part of the variation in the mean volume.

In the northern Finland, the mean volume of the growing stock by municipalities was under 100 m<sup>3</sup>/ha. The highest mean volume in the northern Finland was in Nivala in Pohjois-Pohjanmaa forestry centre (95 m<sup>3</sup>/ha). In Kainuu forestry centre, the mean volume by municipalities varied from 65 m<sup>3</sup>/ha in Vaala to 83 m<sup>3</sup>/ha in Paltamo, and in Lapland, from 69 m<sup>3</sup>/ha in Kemi to 15 m<sup>3</sup>/ha in Utsjoki. Compared to MS-NFI8 estimates, the mean volume had increased by several cubic metres per hectare throughout the whole country except in Åland and in Etelä-Savo forestry centres where there was a slight decrease. The highest increase in mean volume between the two inventories was in southern and southwestern Finland and in northern Finland, especially in Kainuu (Tomppo et al. 1998b).

The mean volume of pine was highest in the municipalities of eastern Finland and western Finland except Pohjanmaan rannikko, while the mean volume of





spruce was highest in central Finland from south coast to Pohjois-Savo forestry centre. The overall highest mean volume of pine was in Merimasku (88 m<sup>3</sup>/ha). The pine volume exceeded 75 m<sup>3</sup>/ha in 12 municipalities located in Lounais-Suomi, Kaakkois-Suomi, Etelä-Savo and Etelärannikko forestry centres (Fig. 4.1b). Of the tree species, pine had the largest mean volume in the municipalities in Åland, Etelä-Pohjanmaa and Pohjois-Karjala forestry centres and in northern Finland with a few exceptions. In northern Finland, the highest mean volume of pine was in Reisjärvi (55 m<sup>3</sup>/ha), and the lowest was in Utsjoki (3 m<sup>3</sup>/ha). In southern Finland, the lowest mean volume of pine was in Korsholm-Mustasaari (25 m<sup>3</sup>/ha). Compared to MS-NFI8, the mean volume of pine had usually increased throughout the whole country except in Åland. The largest positive changes were in Pohjois-Pohjanmaa and Kainuu (Tomppo et al. 1998b).

The municipalities with a low mean volume of pine are usually spruce dominated, but in North Finland the mean volume is low for all tree species because of physical conditions. In the municipalities with high proportions of forests on fertile site types and high cumulative temperature, the overall mean volume is usually high. Spruce is dominant on more fertile soils than pine and consequently a high proportion of spruce dominant forests are associated with high mean volumes. The highest mean volume of spruce was in Hauho and Mäntsälä (108 m<sup>3</sup>/ha), and also in Humpvila and Hämeenkoski the mean volume of spruce was over 100 m<sup>3</sup>/ha (Fig. 4.1c). In northern Finland, the highest mean volume of spruce was in Kemi (28 m<sup>3</sup>/ha). The spruce volumes were high in the same areas as high overall mean volume, except in Pohjanmaan rannikko where the mean volume of spruce was relatively high, even though the mean volume of all tree species was relatively low. Municipalities with the lowest spruce volumes in southern Finland were in Etelä-Pohjanmaa and Åland, the lowest was in Brändö (1 m<sup>3</sup>/ha). Overall lowest spruce volume was in Utsjoki (under 1 m<sup>3</sup>/ha) both on forest land and on FPPF (Fig. 4.1c, Appendix 1, Tables 6a and 7a). In only three municipalities in northern Finland, Kemi, Tornio and Keminmaa, all in Lappi forestry centre, did spruce have the highest mean volume among the tree species. Compared to MS-NFI8, Etelä-Savo forestry centre was the only one where the mean volume of spruce had decreased. The changes were very small in the other forestry centres (Tomppo et al. 1998b).

Birch had the highest mean volume after pine and spruce over the entire country, with a few exceptions in Åland. Many of the municipalities with high mean volume of spruce also had relatively high birch volumes (Figs. 4.1c, d). Exceptions are in northern Finland, e.g., in southern part of Pohjois-Pohjanmaa forestry centre where peatland soils are common with pine and birch as dominating species. The mean volume of birch varied between 5 and 25 m<sup>3</sup>/ha, but the average was somewhat lower in the north. Municipalities with relatively high birch volumes also occurred in southwestern Lapland, and in the northernmost Lapland near the forest border. The mean volumes of birch were low: 10 m<sup>3</sup>/ha or less in other parts of Lapland and in the northern parts Pohjois-Pohjanmaa and Kainuu. The mean volume of birch was below 15 m<sup>3</sup>/ha in southern Finland and in parts of Etelä-Pohjanmaa, Keski-Suomi, along the southwestern and southeastern coast and Pohjois-Karjala.

Compared to MS-NFI8, the mean volume of birch had increased by 1–2 m<sup>3</sup>/ha over the entire country, except in Etelä-Savo and Åland (Tomppo et al. 1998b).

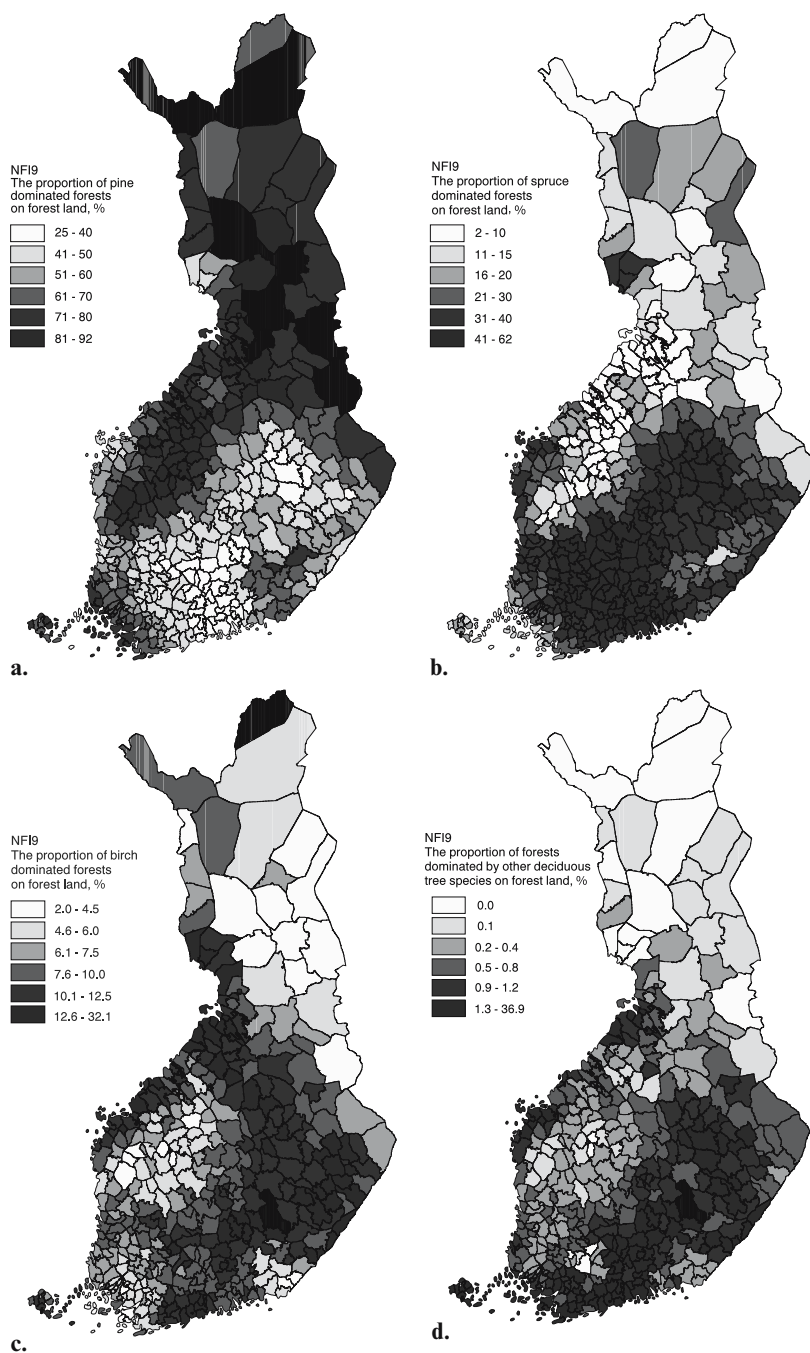
The proportion of other deciduous tree species of the total volume was relatively small. The mean volume of other deciduous tree species is higher in the zone from the south coast to the Pohjois-Savo forestry centre than elsewhere in the country (Fig. 4.1e). Areas with high volumes of other deciduous tree species volume also occur in southwestern coastal areas and in the eastern parts of Kaakkois-Suomi forestry centre. The highest mean volume of other deciduous tree species was in Kökar (22 m<sup>3</sup>/ha), Helsinki (19 m<sup>3</sup>/ha) and Vantaa (18 m<sup>3</sup>/ha). In western Finland, e.g., in Etelä-Pohjanmaa forestry centre, the volumes of other deciduous tree species varied typically from 1 to 3 m<sup>3</sup>/ha. In northern Finland, the largest volumes were in the western parts of Pohjois-Pohjanmaa and southwestern Lapland, being at greatest in Käsämäki (5 m<sup>3</sup>/ha). With some exceptions, the mean volume of other deciduous tree species was below 1 m<sup>3</sup>/ha in Lappi forestry centre, and below 2 m<sup>3</sup>/ha in Kainuu and eastern Pohjois-Pohjanmaa. Compared to MS-NFI8, no significant changes were obtained in the mean volume of other deciduous tree species but a slight increase had occurred in Åland (Tomppo et al. 1998b).

### 4.2.3 *Dominant Tree Species*

The dominant tree species is assessed in the field as a stand-level variable. It is the tree species with the highest volume in the range of development classes from young thinning stand to mature stand, and is defined as the tree species with highest number of stems capable of development in young and advanced seedling stands. The proportion of pine dominant forests has increased significantly during recent decades due to the drainage of peatland forests and intensive silviculture that has favoured pine in regeneration (Tomppo and Henttonen 1996). Since NFI8 (1986–1994, MS-NFI8 in 1990–1994), some changes have taken place in southern Finland where the area of birch dominated forest land has increased and that of spruce dominated forest land has decreased.

For the purpose of comparison, the proportions of the tree species dominance are given first on the basis of field data only. The proportion of pine dominant forests on forest land was 57% in NFI9 in southern Finland, 76% in northern Finland and 65% in the whole country (Finnish ... 2005). In NFI8 and its update in southern Finland (NFI8+), the proportions were 57%, 75% and 65% respectively (Tomppo and Henttonen 1996). The proportion of spruce dominant forests was 31% in southern Finland, 15% in northern Finland and 24% in the entire country being somewhat smaller than in NFI8 (32%, 16% and 25% respectively). The birch dominant forest area has increased from 8% to 10% in southern Finland, whereas the proportion in northern Finland is nearly the same (7%) as in NFI8 (8%) (Tomppo and Henttonen 1996; Finnish ... 2005).

The dominant tree species by municipalities is presented in Appendix 1, Tables 3a and 3b and in Fig. 4.2. These figures clearly indicate that pine is the dominant



**Fig. 4.2** The percentage of pine (a), spruce (b), birch (c) and other deciduous species (d) dominated forests on forest land by municipalities. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

tree species in most of the municipalities. The highest proportion of pine dominated forests was in the municipalities of southwestern, western and northern Finland. In eastern Finland, the proportions were lower, but forests were still strongly pine dominated. In the Etelä-Pohjanmaa forestry centre and in northern Finland, the average proportion of pine dominant forests was greater than 75%. The proportion of pine dominated forests in the municipalities was usually between 45% and 70% in the southern Finland and between 70% and 85% in the north. The lowest proportions were in Häme-Uusimaa forestry centre in Hämeenkoski and Järvenpää municipalities, approximately 25%. The highest proportion was in Etelä-Pohjanmaa forestry centre in Perho, 92%. In northern Finland, the proportions varied from 40% in Kemi to 89% in Inari. The differences in pine dominance between MS-NFI8 and MS-NFI9 were quite small in the southern Finland. On the average, 58% of forest land was pine dominated, as in MS-NFI8. The number of municipalities with pine dominant forests over 80% of the forest land area in the whole country was higher than in MS-NFI8. The average proportion in the northern Finland was 77% in MS-NFI8 and nearly the same, 78%, in MS-NFI9. On the basis of MS-NFI9, there were some municipalities with the pine proportion less than 50% in the northern Finland while none in MS-NFI8 (Tomppo et al. 1998b).

The proportion of spruce dominated forests was usually between 20% and 40% in the South Finland and between 5% and 20% in northern Finland. Häme-Uusimaa and Pirkanmaa were the only forestry centres with high proportion of spruce dominated forests. In Häme-Uusimaa the proportion varied from 31% (in Sammatti) to 62% (in Hämeenkoski); the average was 49%. The percentages in Pirkanmaa varied more, from 13% to 52% and the average was 38%. Fertile forest soils and the high cumulative temperature during the growing season are typical of the Häme-Uusimaa forestry centre and the southern parts of Pirkanmaa forestry centre. Further, in seven other forestry centres there was at least one municipality with more spruce than pine dominated forests, the highest frequencies being in Etelärannikko and Pohjois-Savo centres. The proportion of spruce dominated forests varied between 11% and 55% in Etelärannikko, with an average of 33%. The proportions in Pohjois-Savo varied from 22% to 48%, and the average was 36%. Spruce dominated forests on forest land are rarer in northern Finland, in Åland and in Etelä-Pohjanmaa forestry centres than elsewhere in the country, the averages being around 15% or less. The proportion in Åland was one-third less than in MS-NFI8 while forests dominated by deciduous tree species were more common. MS-NFI9 should be considered more accurate than MS-NFI8, particularly in Åland due to dense field plot grid in there, see also Section 4.3. The proportion of spruce had typically decreased between MS-NFI8 and MS-NFI9 in the other forestry centres. The average proportion of spruce forests in southern Finland was 30% in MS-NFI9 and 32% in MS-NFI8. The average proportion in northern Finland was 14% both in MS-NFI8 and MS-NFI9. In Lapland, there were some municipalities in MS-NFI9 with spruce proportions over 30%. From all 416 municipalities in Finland, spruce dominated forests were most common in 74 municipalities in MS-NFI9, and in 78 municipalities out of 452 in MS-NFI8 (Tomppo et al. 1998b).

Either pine or spruce was the most common tree species in all municipalities in the country when measured as dominant tree species. In two municipalities in Åland, however, over 50% of the forest land was dominated by deciduous tree species. In southern Finland, the proportion of birch dominated forests varied usually from 7% to 11%, and in northern Finland from 4% to 9%.

The proportion of birch dominated forests was usually between 6% and 12% in southern Finland and between 4% and 10% in northern Finland. The proportion of birch dominated forests was highest in Etelä-Savo. A relatively high proportion of birch dominated forests also occurred in eastern and southern parts of the country. The whole western coast up to southwestern Lapland had also a high proportion of birch dominated forests. The highest proportion of birch dominant forests in the country, 32% was in Utsjoki municipality in the northernmost Finland. The proportion of birch dominated forests was the lowest in the forestry centres of Lounais-Suomi, Etelä-Pohjanmaa as well as in large areas in Kainuu, Pohjois-Pohjanmaa and Lappi (Fig. 4.2c). A group of municipalities with relatively low proportion of birch was also in southeastern Finland, around 5%. The proportion of birch dominated forests had increased after MS-NFI8 especially in forestry centres Pohjois-Savo, Etelä-Savo, and Åland.

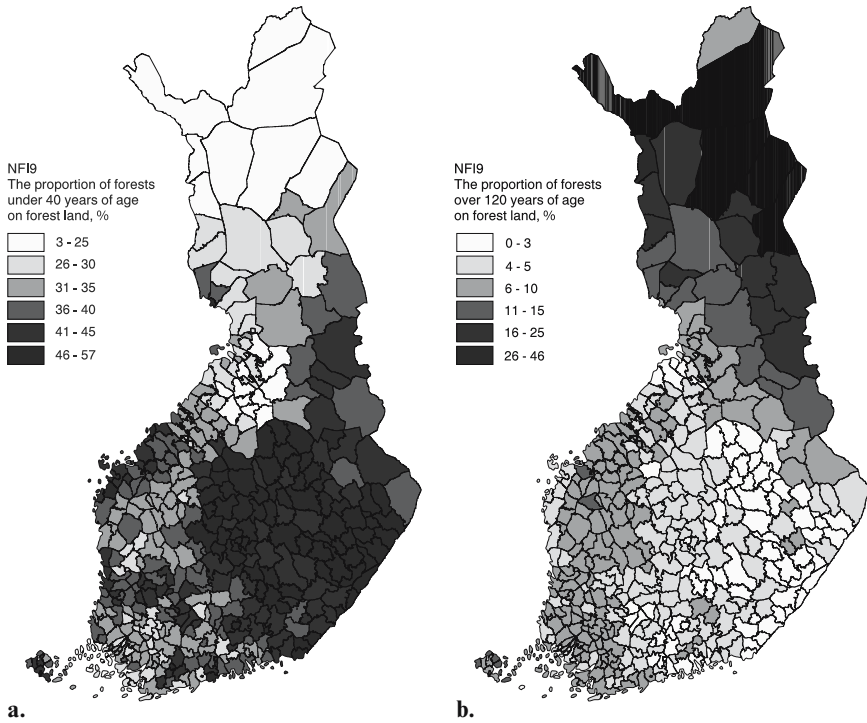
The most common deciduous species in Finland, other than birch, are aspen (*Populus tremula* L.), grey alder (*Alnus incana* L.) and European alder (*Alnus glutinosa* L.), as well as in Åland and in southernmost Finland as minority also some hard-wood species such as oak (*Qeucus robur* L.) and European Ash (*Fraxinus excelsior* L.). The proportion on forest land dominated by other deciduous tree species was typically between 0.4% and 1.2% in southern Finland and 0.2% or less in the north. The highest average proportion in the forestry centres was in Åland, 7%. The proportion by municipalities in the southeasternmost Finland was usually around 1% or less, while it exceeded 5% in the most municipalities in Åland, as well as in three municipalities in Etelärannikko (Fig. 4.2d). The proportion was 1.5% or more in some municipalities in southern Finland in Häme-Uusimaa, Kaakkois-Suomi, Pohjois-Savo and around Vaasa in Pohjanmaan rannikko. The other deciduous tree species were quite equally distributed in Etelä-Savo where their proportion was a little higher than elsewhere in the country. Same holds for Outokumpu, Polvijärvi and Pyhäselkä municipalities in Pohjois-Karjala forestry centre. Slash-and-burn agriculture lasted longer in these areas than elsewhere and the proportion of fertile sites is also relatively high in these regions. The average proportion of other deciduous species by municipalities was less than 0.5% in the forestry centres of northern Finland and Etelä-Pohjanmaa. The highest proportions in northern Finland were in the coastal region of Pohjois-Pohjanmaa forestry centre, in particular in the municipalities of Lumijoki (2%), Raahe (1.6%) and Pyhäjoki (1.5%). The proportion of forests dominated by other deciduous tree species had increased since MS-NFI8, especially in Åland but also in the forestry centres of Etelärannikko, Etelä-Savo and Pohjois-Karjala. A substantial decrease had taken place in Lounais-Suomi, Pirkanmaa and Pohjois-Savo (Tomppo et al. 1998b) (Fig. 4.2d, Appendix 1, Table 3a).

Poorly productive forest land (PPF) consists either of rocky soils, field forests or less fertile peatland soils, such as oligo-ombrotrophic or ombrotrophic peatlands, e.g., *Sphagnum fuscum* dominated peatlands. These sites are often close to being in a natural state often with pine as the dominant tree species or in some cases birch. Wood production is possible, but the mean annual production is low, see Chapter 2. The dominant tree species on PPF are presented in Appendix 1, Table 3b. Pine was the dominant tree species on PPF in all forestry centres. The proportion of pine dominant forests on PPF was under 90% in Åland, Pohjanmaan rannikko, Häme-Uusimaa, Pirkanmaa, Etelä-Savo and Lapland. In these forestry centres, the proportion of birch varied from 6% in Åland to 31% in Lapland. The highest proportions of other deciduous tree species were approximately 5% in Åland and Pohjanmaan rannikko. Spruce dominated forests occurred on PPF in northern Finland, the average being 5% in Pohjois-Pohjanmaa and 11% in Lapland. Moderate changes occurred in the proportions of dominant tree species on PPF between MS-NFI8 and MS-NFI9. In MS-NFI9, the proportion of pine dominant forests was greater in Pohjois-Savo and Kainuu and lower in Häme-Uusimaa. The proportion of spruce was very low in both inventories in southern Finland but in the north the proportion was higher and increased slightly. The proportion of deciduous tree species had increased in Häme-Uusimaa and decreased slightly in Kainuu and Pohjois-Pohjanmaa (Tomppo et al. 1998b, Appendix Table 3b). Estimation errors are high concerning the proportion of tree species on PPF and so it can be difficult to determine whether the changes are real or not.

#### 4.2.4 Age Class Distribution on Forest Land

The age class distribution on forest land by municipalities is given in Appendix 1, Table 4a and the mean volume of the growing stock in age classes in Table 4b. The proportion of forests with an age of not more than 40 years is presented in Fig. 4.3a and that with an age of over 120 years in Fig. 4.3b. The aggregates of MS-NFI estimates of age classes and mean volumes in age classes from the forestry centres were unbiased in almost all classes compared to the field inventory estimates. In MS-NFI8, an overestimation of open areas and young age classes was observed in the aggregates of the municipality results. This was considered to result from an overestimation of forestry land area based on map data (Tomppo et al. 1998b). The methods used to correct for the map errors in the NFI9 small-area estimates (Subsection 3.2.5) decreased the probability of this kind of error.

Forests under 40 years accounted for 40% or more of forest area in central and southeastern Finland, while in Lapland (forestry centre 13) the proportion was less than 35% in most municipalities (Fig. 4.3a). The proportion was above 55% in the municipalities Parikkala and Pyhäselkä in eastern Finland. In the three northernmost municipalities, the proportion of forests under 40 years was less than 15%. The difference of proportions in north-south direction is natural because the average rotation time of forest stands increases towards the north of Finland. Compared



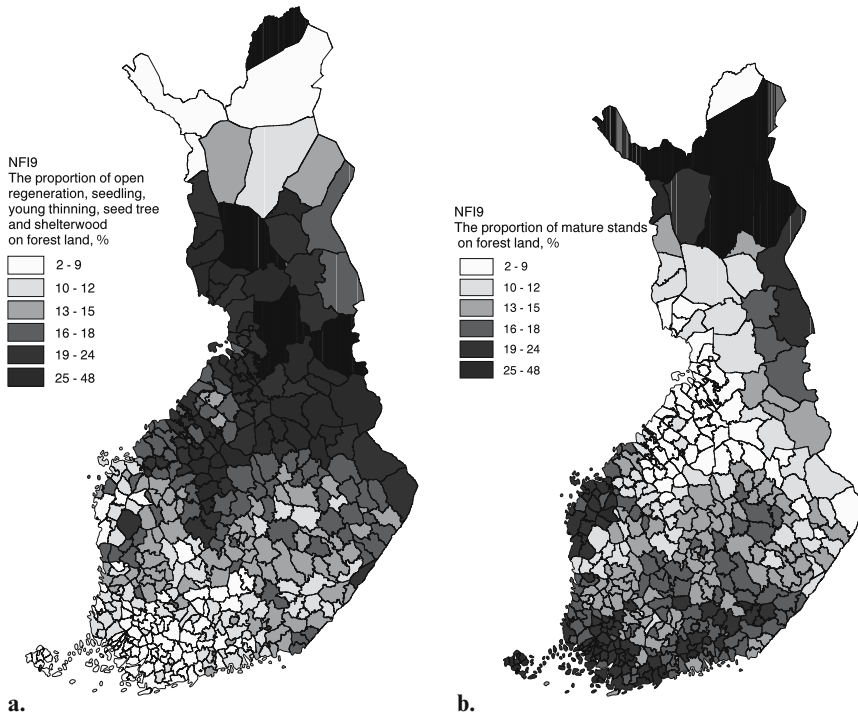
**Fig 4.3** The proportion of forests with age of 0–40 (a) and over 120 (b) years on forest land by municipalities. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

to the results of MS-NFI8, the proportions of forests under 40 years have increased in municipalities in eastern Finland (Tomppo et al. 1998b, fig. 16a).

The proportion of old forests, over 120 years, varied between zero and 10% in the municipalities of southern and central Finland, with a few exceptions. The high proportions were naturally found in Lapland, with the highest proportion 46% in Inari municipality, due to reasons explained in the previous paragraph, and also due to large areas of protected forests (Fig. 4.3b).

### 4.2.5 Distribution of Development Classes

The development class distribution on forest land by municipalities is presented in Appendix 1, Table 5a and the mean volume of growing stock in development classes in Table 5b. For the definitions of development classes, see Chapter 2. The combined proportion of forests belonging to development classes open regeneration area, young seedling, advanced seedling, young thinning, seed tree or



**Fig 4.4** The proportion of development classes of open regeneration, seedling, young thinning, seed tree, and shelterwood (a) and mature forests (b) on forest land by municipalities. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

shelterwood stand are presented in Fig. 4.4a. The highest percentages, over 65% in many municipalities, were found in forestry centres Kainuu, Pohjois-Pohjanmaa and in southern parts of Lapland. The proportion was over 80% in two municipalities, Perho and Utsjoki. The proportion of these development classes remained below 55% in southwestern Finland, with the lowest proportions, below 30%, in the coastal municipalities. Compared to MS-NFI8, the proportion of these development classes had increased in central Finland.

The proportion of mature stands, ready for regeneration cuttings, varied from 2% to 48% in the municipalities (Fig. 4.4b). The highest proportions were found in coastal areas of southern Finland and in northern Lapland. The proportion exceeded 30% in municipalities Kumlinge, Iniö, Houtskär, Brändö, Inari and Enontekiö. The forestry is not intensive in these areas and the proportion of protected forests is high in some of these municipalities. In the Åland archipelago, the proportions differed from that in MS-NFI8, which was partly due to the poor ground truth available in the MS-NFI8 estimation (Tomppo et al. 1998b).



### 4.2.6 Available Energy Wood

Appendix Table 8a presents, the biomass estimates by tree species groups in young thinning stands (development class). The biomasses of stem and bark, branches and foliage were calculated from those field plots where first commercial thinning was proposed for the first 5-year-period or where pre-commercial thinning was proposed and the treatment was already considered to be delayed in the corresponding stand. In addition, the proportion of the field plot biomass, capable to be removed (28–43%), was estimated using the regional thinning regimes of pine, spruce and birch on most common site fertility classes (Mesic forests and Sub-xeric forests) according to the dominant tree species of the field plot stand (Hyvän metsänhoidon suosituksset 2006) (Table 4.2). The biomass estimates of mature forests are given separately for branches, foliage and stem residuals, and stumps and large roots by tree species groups in Appendix Table 8b.

The calculation of biomass estimates for different tree compartments is presented in Subsections 2.1.2 and 3.2.2. When aggregating the municipal level estimates, the largest energy wood biomass was found in mature forests for the combined tree compartments branches, foliage and stem residuals (95.5 Tg ( $10^{12}$  g)) and for the compartments stumps and large roots (71.6 Tg). When considering the tree species groups and development classes, the largest energy wood biomass was 49.8 Tg for spruce in mature forest for the branches, foliage and stem residuals, and 33.2 Tg for stumps and large roots. The potential energy wood biomasses from young thinning stands was 34.9 Tg for stem and bark, 10.3 Tg for branches, and 4.9 Tg for foliage. For comparison, the field inventory estimates were also calculated at forestry centre level using the same predicted biomasses for sample trees as for MS-NFI estimation. In the mature forests, the estimates for branches and foliage was 90.0 Tg and for stumps and large roots 74.5 Tg. Note that the stem residual compartment of a tree is missing from the first figure and so it is smaller than the MS-NFI estimate. The biomass of the energy wood stumps and large roots was underestimated by the MS-NFI. The NFI estimate of stumps and large roots for spruce was 34.9 Tg, again slightly underestimated by the MS-NFI method. The slight underestimation of the biomass for mature stands is consistent with the fact that the total growing stock for this particular development class was underestimated by 2.7% by the MS-NFI method compared to the pure field data based

**Table 4.2** Removal percentages applied for pre-commercial and first commercial thinnings by regions (degree days) and dominant tree species of the NFI field plot stands. Site fertility classes: Herb rich heath (HRHF), Mesic (M) and Sub-xeric (SX) forests.

Degree days	Removal (%) (site fertility class of the regime)		
	Pine	Spruce	Deciduous
>1,200 dd	34 (SX)	32 (M)	43 (HRHF, M)
1,000–1,200 dd	32 (SX)	34 (M)	43 (HRHF, M)
<1,000 dd	33 (SX)	31 (M)	28 (HRHF, M peatlands)

estimates (Appendix 1, Tables 5a and 5b). By forestry centres, the difference between the MS-NFI estimate and the NFI estimate of stumps and large roots varied between a 10% underestimation to a 9% overestimation. For estimates of spruce stumps and large roots, the largest overestimate was 14% for the Åland forestry centre and largest underestimation was 14% for the Pohjanmaan rannikko forestry centre. Thus, the largest relative differences were found in the smallest forestry centres. Similar comparisons were not made for young thinning stands.

The largest biomass of energy wood in mature forests was in the northernmost forestry centre that is characterised by a large area of mature forests. The estimates for this centre also include energy wood from forests not used for wood production. In Lapland, the biomass of energy wood in the municipality Inari was 5.2 Tg in branches, foliage and stem residuals, and 3.7 Tg in stumps and large roots (Appendix 1, Table 8b). In practice, the stumps and large roots are only extracted from spruce dominated regeneration areas. The largest spruce biomass of stumps and large roots was in the municipality of Sodankylä, in Lapland. The amount of biomass in mature stands is correlated with the area and the mean volume of the particular development class in a municipality. The land areas of the municipalities in North Finland are far larger than those in southern parts of the country.

The largest energy wood estimates in young thinning stands were located in northern and eastern Finland. In forestry centre Pohjois-Pohjanmaa, the biomass in stem and bark was 4.6 Tg, in branches 1.3 Tg and in foliage 0.6 Tg. The highest biomasses among the municipalities were in Lieksa, 648,000, 180,000 and 83,000 t, respectively. Lieksa also had the largest potential pine biomass in young thinning stands. The largest potential spruce biomass was in the municipality of Heinävesi – 133,000, 28,000 and 11,000 t respectively in stem and bark, branches, and foliage (Appendix 1, Table 8a).

The energy wood estimates indicate the available potentials rather than the energy wood volumes available for harvest in practice. The practical constraints in use and harvesting of energy wood were not taken into account. Laitila et al. (2008) has estimated the amount of annual available energy wood chips in solid cubic metres from regeneration fellings and young thinning stands in Finland using NFI field plots and forestry statistics. In young thinning stands the plots with energy wood removal more than 25 m<sup>3</sup>/ha and with commercial removal less than 25 m<sup>3</sup>/ha were selected from NFI data. For regeneration cuttings, the estimations were based on annual commercial roundwood removals on the basis of forestry statistics. Only spruce stumps were included to the estimated amount of stump biomass because the stumps of the other tree species are not harvested in practice. The practical technical coefficients of losses in harvest were applied for the stumps, branches and foliage. Applying a biomass expansion factor of 0.5, the energy wood potential in wood chips for first commercial thinnings was 3.5 Tg/year, and for clear fellings for stem residuals, branches and foliage of the all coniferous tree species 3.3 Tg/year, and for the stumps and roots of spruce 1.3 Tg/year. These estimates are much smaller than our energy wood potential estimates, e.g. for the stumps and large roots of spruce the MS-NFI estimate is 33.3 Tg and for stem residuals, branches and foliage of the coniferous species 76.1 Tg. However, if the MS-NFI estimates would

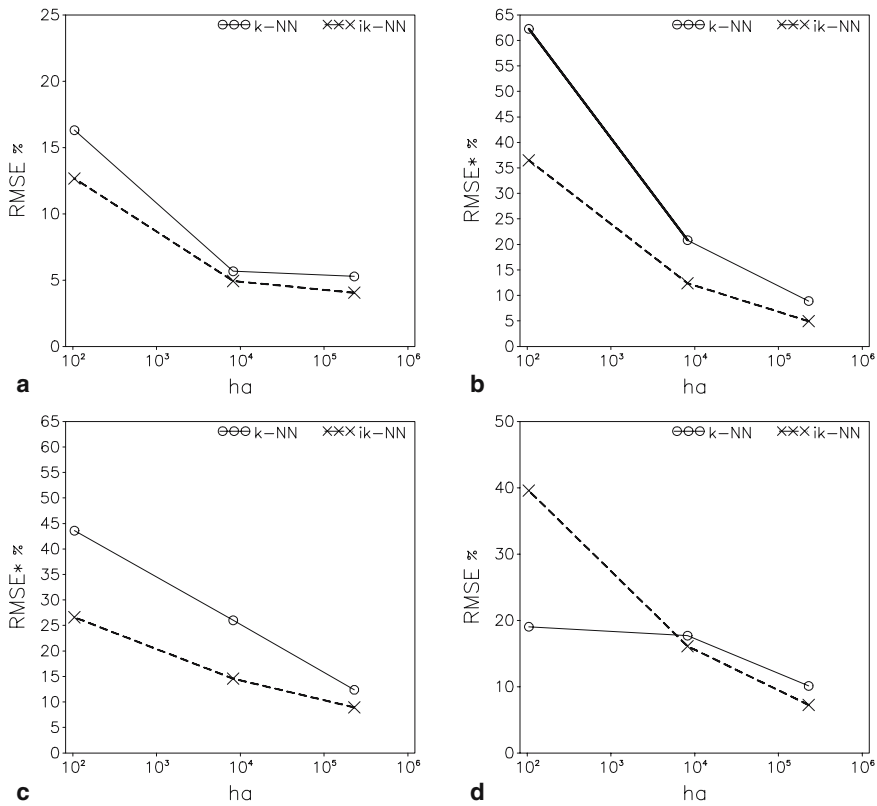
be divided to, e.g. a 10-year-period, and calculated for forest available for wood production only, as well as the percentage of harvest losses taken into account, same magnitude of figures would be obtained as in Laitila et al. (2008).

It is important to recall that the energy wood estimates represent energy wood potential rather than the energy wood available in practice. Note also that the biomass estimates for energy wood were based on sample trees data only. The biomass of energy wood was thus calculated for each plot using a very few trees. The plot level variation caused by sampling is rather high but should not affect the municipality level estimates due to the fact that a large number of field plots were used to calculate the estimates. The fact that the tree level biomasses are predicted using Swedish models (Marklund 1988) may also cause some bias to the estimates. It is not possible to analyse the possible model errors resulting from the use of Swedish models with Finnish data.

### **4.3 Accuracy of Small-Area Estimates from MS-NFI8 and MS-NFI9**

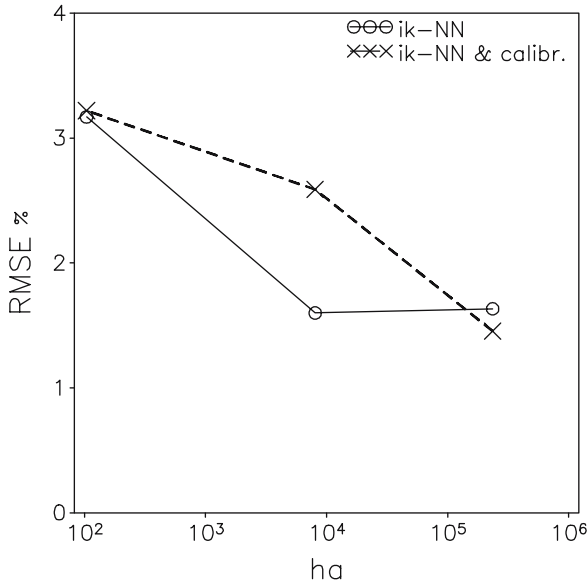
#### ***4.3.1 Empirical Errors of MS-NFI9 Small-Area Estimates Based on Independent Inventory Data***

The precision of the multi-source inventory estimates for small areas has been assessed empirically using independent test data. Relative RMSEs of 5%, 12%, 15% and 16% for mean volume and mean volumes of pine, spruce and birch, respectively, were obtained in seven test units of size 100 km<sup>2</sup> when the estimates from MS-NFI9 (ik-NN) were compared to independent field inventory based estimates in Eastern Finland (Katila 2006b). Corresponding relative RMSEs for three small areas of size 1 km<sup>2</sup> were 13%, 37%, 27% and 40%. The RMSEs for 1 km<sup>2</sup> are conservative error estimates because the test units were purposively selected to represent areas of extreme mean volumes. It should be noted that the error components (sampling, measurement and model errors) of the independent test data contribute to the total error (MSE) obtained from these comparisons, although they were not very significant in that particular study, whereas the measurement error component in the empirical RMSEs presented in Tomppo et al. (1998b, Fig. 14) was probably significant. In Fig. 4.5 the relative RMSEs of mean volume and mean volumes by tree species estimates obtained for the MS-NFI, k-NN and ik-NN, were presented against the average area of forest and poorly productive forest land (FPPF) for the small and large test units (Katila 2006b). In addition, the RMSEs were calculated for groups of municipalities (1,700–2,900 km<sup>2</sup> of FPPF) from the MS-NFI9 estimations covering the NFI9 field work area in the year 2000. These results were extracted from Tomppo and Halme (2004). The ik-NN resulted in a smaller relative RMSE than k-NN, especially for the mean volume of pine and spruce. The RMSEs of all the variables decrease when the size of the units



**Fig. 4.5** The relative RMSE (%) of mean volume (a), mean volume of pine (b), mean volume of spruce (c), and mean volume of birch (d) of k-NN and ik-NN against the average area (logarithmic scale) of forest and poorly productive forest land of large and small test units and groups of municipalities from the year 2000 NFI field work area.

increases. However, the decrease is slower between 100 and 2,300 km<sup>2</sup>. The same setup was used in Fig. 4.6 that presents the relative RMSEs of forest land area estimates obtained from ik-NN with and without calibration for map errors. The forest land estimates are quite accurate even for 1 km<sup>2</sup> areas. The calibration increased the precision only for larger areas; the method is sensitive to the deviation of the properties of the small area's map data from that of the inventory area (as was the case for the independent test data) (Katila 2006b). The precision of the MS-NFI forest land estimates broken down to development classes (ha) and the total volume (1,000 m<sup>3</sup>) estimates for these classes was also studied using seven independent test units of size 100 km<sup>2</sup> (Fig. 4.7) (for definition of development classes, see Appendix 1, Table 5). The RMSEs for estimating the area of each development class over the seven test units are presented in both absolute and relative scale in Fig. 4.7a and the corresponding RMSEs for total volume estimates in Fig. 4.7b. The relative RMSEs

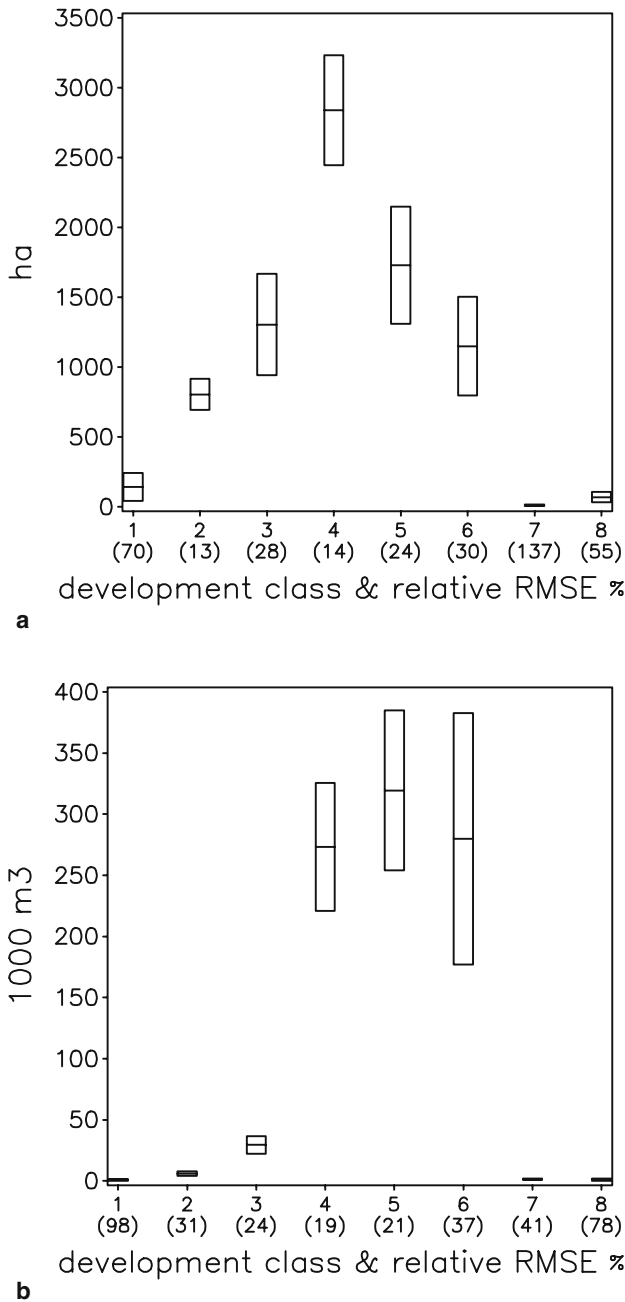


**Fig. 4.6** The relative RMSE (%) of forest land area estimate from ik-NN, with and without calibration for map errors, against the average area (logarithmic scale) of forest land of large and small test units and groups of municipalities from the year 2000 NFI field work area.

are rather high, especially for small classes, and even the smallest RMSEs are more than 10%. Total volume estimation combines the error in the area and the mean volume estimation and the RMSEs increase to 20% and more. The empirical errors for MS-NFI development class estimates are rather high but still smaller than the relative errors in the NFI field inventory estimates for strata this small (Tomppo et al. 1998a).

### 4.3.2 Assessing the Systematic Errors of the MS-NFI8 and MS-NFI9 Municipality Estimates

Successive NFI results can be used to detect trends or changes in the state of forests. One prerequisite for this analysis is that the NFI estimates are precise enough (and unbiased) to enable the comparison. The relative accuracies of the estimates from MS-NFI8 and MS-NFI9 were therefore examined. The errors of the MS-NFI estimates were investigated employing the estimates by sub-regions based on the field inventory (Subsection 3.2.1). The validation was conducted separately for MS-NFI8 and MS-NFI9 on 30 municipality groups. The *a priori* assumption was that MS-NFI9 estimates are more precise because (1) an improved k-NN method

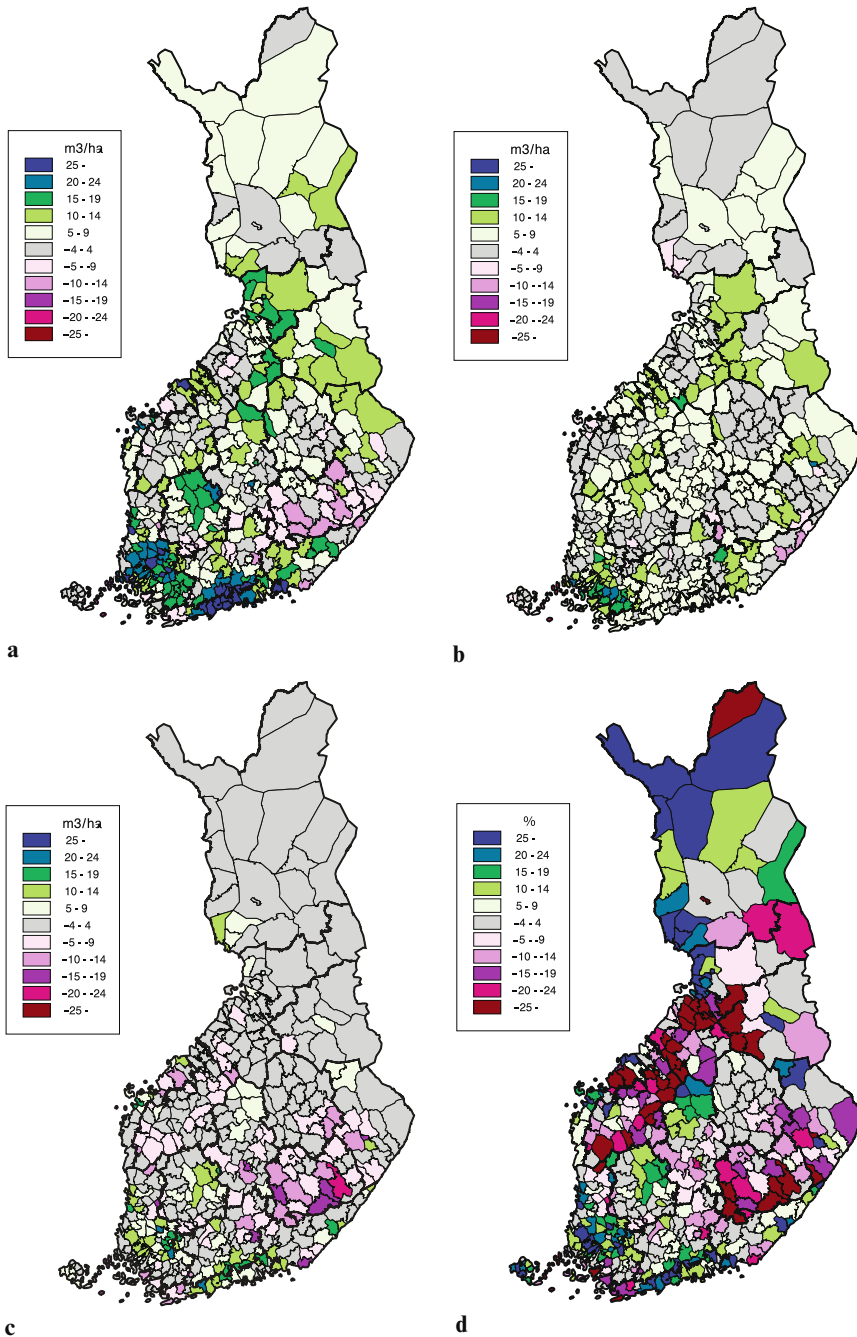


**Fig. 4.7** The RMSE of area estimates (a) and total volume estimates (b) from ik-NN for different development classes over seven 100km<sup>2</sup> test units, relative RMSEs in brackets below horizontal axis. Error bars centred to average of true area and total volume estimates in field.

was used in the estimation (Subsection 3.2.3), (2) high emphasis was put on the unbiased estimation of volumes by tree species at the sub-regional level, (3) the numerical map data employed was more accurate and the effect of map errors on MS-NFI9 estimates was corrected, (4) Landsat 7 ETM+ satellite images were largely used instead of Landsat 5 TM, (5) a denser field plot grid than in MS-NFI8 was available in the southern part of the country, and (6) locations of NFI field plots were measured using GPS devices in northern Finland (Forestry centres 11, 12 and 13).

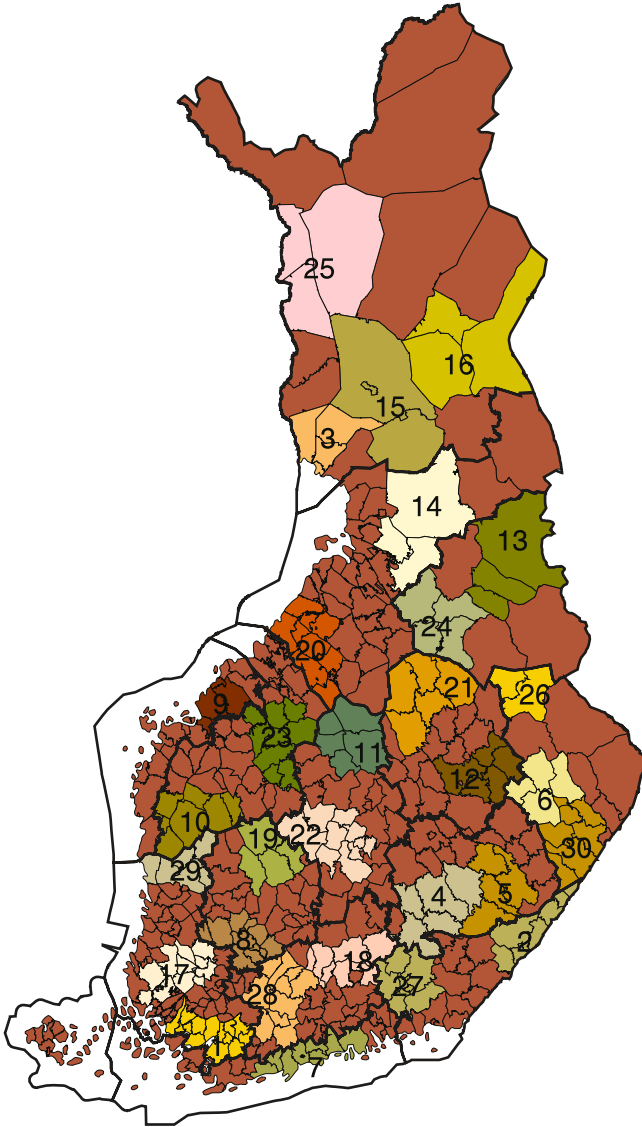
First, differences in MS-NFI9 – MS-NFI8 by municipalities were studied in map form. The variables of interest were area of combined forest and poorly productive forest land (FPPF), mean ( $\text{m}^3/\text{ha}$ ) and total ( $\text{m}^3$ ) volume of growing stock, as well as mean and total volumes by tree species. The differences in mean volume, and mean volume of pine and spruce (both absolute and relative change for spruce) are presented in Fig. 4.8. There are groups of municipalities in the maps with substantial changes, e.g. in forestry centres 1, 2, 3, and 6 for mean volume and mean volume of spruce (Figs. 4.8a, 4.8c). The time span between MS-NFIs ranged from 4 to 9 years. The changes in volumes at municipality level should be rather smooth both in time and in space, i.e. compared to neighbouring municipalities. From NFI8 to NFI9, the mean volume and mean volumes of pine and spruce increased in South Finland from 111.4, 43.7 and 48.2 to 121.4, 50.3 and 48.1  $\text{m}^3/\text{ha}$  respectively, and in North Finland (forestry centres 11, 12 and 13) from 44.7, 25.8 and 10.5 to 59.9, 36.5 and 12.0  $\text{m}^3/\text{ha}$  respectively (Tomppo et al. 2001b, 2007). Groups of municipalities were formed by connecting single adjacent municipalities within the same forestry centre and with large differences in MS-NFI8 and MS-NFI9 estimates (Fig. 4.9). Thirty sub-regions were formed and they were distributed throughout Finland. Because sub-regions 1–15 were deliberately combined from municipalities with large differences, the following results do not provide an average precision estimate of the MS-NFI estimates.

Four types of estimates were calculated for the groups of municipalities using field data from NFI8 and NFI9 and municipality-level estimates of MS-NFI8 and MS-NFI9 results. The field inventory results included the SE estimates (see Subsection 3.2.1). In southern Finland, the MS-NFI8 results were based on the NFI8+ mid-inventory from 1994 (Fig. 4.9 subregions 1, 2, 4-8, 17-19, 26-30) (Tomppo et al. 1998b). The NFI8+ field estimates and error estimates were not considered precise enough and so the sub-region estimates were based on interpolation between NFI8 (1986–1989) and NFI9 (1997–2000), both for the field estimates and for their SEs. The validation for MS-NFI8 is therefore not as precise in southern Finland as for the rest of the sub-regions. Two diagnostic characteristics were employed to study the errors of small-area estimates in the sub-regions: (1) the number of forest variables for which the MS-NFI estimate deviated significantly (more than two SEs) from the field estimate, and (2) the absolute value of difference between the MS-NFI estimate  $\hat{y}_{MS-NFI}$  and the field inventory estimate  $\hat{y}_{NFI}$  scaled by field inventory based SE estimate  $s$  (Formula 3.7), denoted by  $\times SE = |\hat{y}_{MS-NFI} - \hat{y}_{NFI}|/s$ . To simplify comparisons, the average values of  $\times SE$ , ( $\overline{\times SE}$ ), of nine forest parameter estimates were computed for both MS-NFI8 and MS-NFI9 estimates



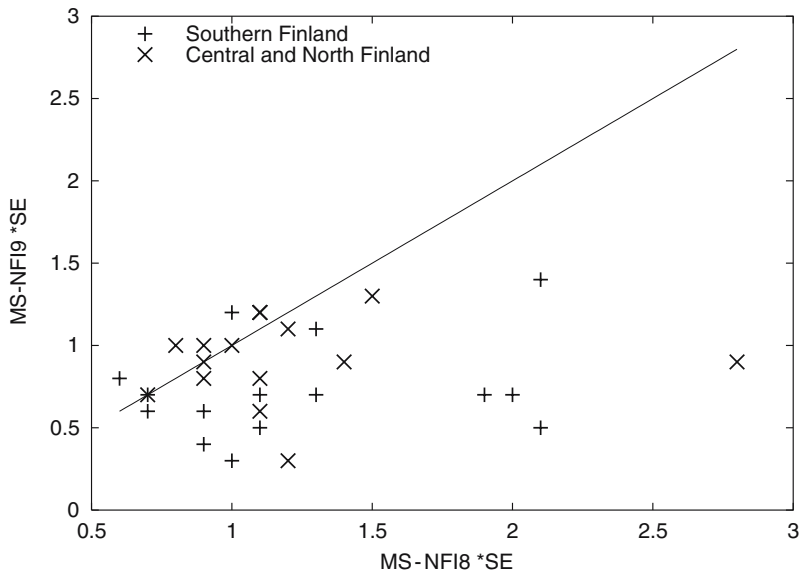
**Fig 4.8** The difference between MS-NFI8 and MS-NFI9 estimates ( $MS-NFI9 - MS-NFI8$ ) for mean volume (a), mean volume of pine (b) and spruce (c) and relative change of spruce volume estimate (compared to MS-NFI8) by municipalities on forest and poorly productive forest land, boundaries of forestry centres from year 2002. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.





**Fig 4.9** Subregions used for the validation of MS-NFI8 and MS-NFI9 estimates, boundaries of forestry centres from 2002. Digital map data: ©National Land Survey of Finland, licence No. 363/MML/08.

by sub-regions. These parameters were area of FPPF, total and mean volume of growing stock and total and mean volumes for pine, spruce and birch (Fig. 4.10). The value of  $\times SE$  was larger for MS-NFI8 than MS-NFI9 in the most cases, and the differences were largest for sub-regions in southern Finland. In four cases, the

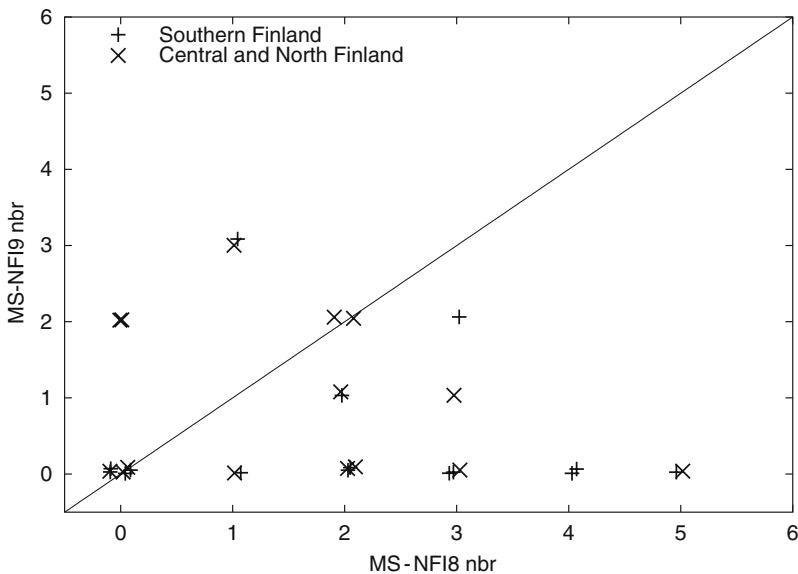


**Fig. 4.10** The absolute value of difference between MS-NFI and field inventory estimate scaled to field inventory SE, the average for nine forest variable estimates in MS-NFI8 and MS-NFI9 on 30 subregions.

$\times \overline{SE}$  for the MS-NFI8 was one SE larger than for the MS-NFI9. In Table 4.3, the average values  $\times \overline{SE}$  are presented for two groups of variables, for core forest variables (area of FPPF, total and mean volume) and tree species (total and mean volumes for pine, spruce and birch). The differences in these averages indicate that the MS-NFI9 estimates are more precise for the tree species volume estimates, as expected from an earlier study (Tomppo and Halme 2004). The difference is noticeable in southern Finland. Apart from methodological advances, the results may be caused by less certain field inventory estimates (interpolated) in NFI8 than in NFI9, and a smaller number of field plots in the MS-NFI8 training data than in MS-NFI9 data. The number of variables for which the MS-NFI estimate was significantly biased varied from 0 to 5 out of 9 in MS-NFI8 and 0 to 3 in MS-NFI9 (Fig. 4.11). In 14 out of 30 sub-regions, the number of variables with a significant bias was greater in MS-NFI8 than in MS-NFI9. Note that one cause for systematic errors between MS-NFI8 and MS-NFI9 estimates may be the satellite image mosaic used in each MS-NFI. Each satellite image scene is analysed separately. Small areas, e. g. municipalities, in successive MS-NFIs may therefore employ field plots from different geographical reference areas depending on how the small area is located with respect to the applied satellite image on different occasions (Katila and Tomppo 2001).

**Table 4.3** The absolute value of difference; between MS-NFI and field inventory estimate scaled to field inventory SE, the average for main forest variable (area of FPPF, total and mean volume) and tree species variable (total and mean volumes for pine, spruce and birch) estimates in MS-NFI8 and MS-NFI9 and number of occasions in which the MS-NFI estimate deviated significantly (more than two SEs) from the field estimate. Results over subregions for southern Finland, central and northern Finland, and for all the 30 subregions.

Regions	Variables	$\overline{xSE}$		Difference	$\overline{xSE}$ (%)	No. of significant bias	
		MS-NFI8	MS-NFI9			MS-NFI8	MS-NFI9
Southern Finland	Main forest variables	1.04	0.85	-0.19	-18	6	2
	Tree species	1.34	0.66	-0.68	-51	24	4
Central & North Finland	Main forest variables	1.00	0.92	-0.08	-8	3	1
	Tree species	1.28	0.90	-0.38	-30	20	12
All subregions	Main forest variables	1.02	0.89	-0.13	-13	9	3
	Tree species	1.31	0.78	-0.53	-40	44	16



**Fig. 4.11** The number of variables (nine in total) for which the MS-NFI estimate deviates significantly (more than two SEs) from the field estimate MS-NFI8 and MS-NFI9 on 30 subregions.

### 4.4 Digital Thematic Output Maps

Thematic forest maps in raster format were produced for the most important forest variables: land class, site fertility class, stand age, mean height of stands, stand basal area, and volumes by tree species and timber assortments, for four tree species

**Table 4.4** Twenty thematic map layers produced by MS-NFI9.

Thematic maps, raster format, 25 × 25 m	Area covered, forestry centres
20 layers	
- Stand age (a)	
- Stand basal area (m <sup>2</sup> )	
- Total volume (m <sup>3</sup> /ha)	
- Pine volume (m <sup>3</sup> /ha)	
- Pine log volume (m <sup>3</sup> /ha)	
- Pine pulpwood volume (m <sup>3</sup> /ha)	
- Spruce volume (m <sup>3</sup> /ha)	
- Spruce log volume (m <sup>3</sup> /ha)	
- Spruce pulpwood volume (m <sup>3</sup> /ha)	
- Birch volume (m <sup>3</sup> /ha)	
- Birch log volume (m <sup>3</sup> /ha)	
- Birch pulpwood volume (m <sup>3</sup> /ha)	
- Other broadleaved volume (m <sup>3</sup> /ha)	
- Other broadleaved log volume (m <sup>3</sup> /ha)	
- Other broadleaved pulpwood volume (m <sup>3</sup> /ha)	
- Mean height of stand (dm)	
- Crown cover (%)	0, 1a, 2–3, 8–13
- Land class (3 classes)	0, 1a, 2–3, 8–13
- Main site class (4 classes)	
- Site fertility class (8 classes)	

or species groups (pine, spruce, two birch species combined, and other broad leaved tree species). Twelve volume maps were produced for volumes of saw timber, pulp wood and total volume. The basal-area-weighted median heights for field plot stands of thinning or older stage development classes in the ground truth data were obtained using models applied to tally trees, apart from forestry centres 11, 12 and 13 where they were measured directly in the field. The maps produced are in georeferenced raster layers of 25 × 25 m resolution (Table 4.4). The non-forestry land use cover was obtained from the digital land use map data and overlaid on the satellite image data during the estimation phase. For the rest of the area the k-NN pixel-level predictions were used. An example of the total volume thematic map is given in Fig. 3.2c. The raster layers can be combined (also with other information sources) and new products, e.g. dominant tree species and mean volume classes by tree species dominance, can be calculated. Appendix 2 shows maps of the mean stem volume of growing stock for Finland (Fig. 1) and for forestry centres (Figs. 3–15) and the dominant tree species map for Finland (Fig. 2).

Due to the corrections for map errors employed in the municipal level estimates (Appendix 1) the sum and mean values calculated from raster layers will in most cases yield slightly different area and volume estimates. Most probably, the forestry land area obtained will be greater and the mean volume estimates smaller than in the tables in Appendix 1 (cf. Subsection 3.2.5).

# Chapter 5

## Discussion

**Abstract** The differences of the old k-NN method and the current ik-NN method are summarised. The ik-NN technique is the core of the current Finnish multi-source forest inventory. The most common applications of the output results together with the data users of the Finnish multi-source forest inventory are discussed. The limitations and several error sources of the satellite image-aided estimation and prediction methods are outlined. Some of these error sources and limitations are also valid for the other satellite image based methods and applications. The MS-NFI method, compared to commonly employed satellite image methods, can be regarded as a small-area estimation method that adds to the usual pixel-level prediction method. The small-area estimates are applicable regardless of the relatively high pixel-level errors.

**Keywords** Multi-source forest inventory, satellite images, error sources

Satellite images and numerical map data, in addition to field data, have been utilised in the Finnish national forest inventory (NFI) since 1990. The system called multi-source forest inventory (MS-NFI) has produced small-area estimates of the core forest parameters, such as areas and volumes divided into sub-categories, as well as predictions of forest variables presented as maps. The small areas are municipalities, over 400 in the country. The national forest inventory (NFI) that utilises field data only provides estimates for 14 administrative areas called forestry centres (Fig. 1.1), as well as for some smaller areas. The methods and results of the first country-level MS-NFI, MS-NFI8, are presented in Tomppo et al. (1998b). This book introduces the new methods, developed and employed during MS-NFI9, as well as the municipality level estimates of MS-NFI9, based on field data of NFI9 (1996–2003). The estimates obtained by MS-NFI are part of the official NFI statistics in Finland, some of which are available via the internet (Metinfo 2007).

There are several error sources and therefore many difficulties related to the MS-NFI method. Consequently, the method is more or less under continuous development. The main differences in the new k-NN method introduced during MS-NFI9 compared to the earlier k-NN method employed during MS-NFI8 are: (1) the use of functions of spectral features in addition to spectral bands in the distance metric

(as predictors), (2) the use of coarse scale forest variables as additional features in the distance metric (as predictors), (3) optimization of the weights for all predictors in k-NN using a genetic algorithm (the new algorithm with these properties is called an ik-NN algorithm), and (4) the use of a statistical correction method to reduce the effect of map errors in the municipality-level estimates. Furthermore, increased emphasis in the MS-NFI9 was placed on accuracy. All estimation parameters were selected on the basis of numerous validations of the estimates at pixel level, and especially when concerning groups of municipalities. The availability of a full field-plot dataset for the entire country in MS-NFI9, as opposed to a subsample in southernmost Finland in MS-NFI8 also decreased the errors. Consequently, the MS-NFI9 estimates can be considered to be more accurate than the MS-NFI8 estimates (see Section 4.3). The differences between MS-NFI8 and MS-NFI9 estimates should be taken into account when comparing municipality-level aggregates of pixel-level predictions. Due to many different possibilities provided by method developments in the methodology, the application of ik-NN algorithm demands quite a lot of fine-tuning, depending on the satellite image and on the target area in question.

The MS-NFI results, the municipality level estimates and maps, are employed by forestry authorities, forest industries, and other interest groups as follows:

1. Forestry centres use the results for assessing the differences in forest resources, and also to some extent, silvicultural needs and cutting possibilities between municipalities within a Forestry centre, as well as calibrating their own management inventory estimates. To fulfil the information needs concerning small areas was the original purpose of the MS-NFI in the late 1980s.
2. Forest industries employ the results in their timber procurement planning by integrating forest holding boundaries and ownership information into the map predictions.
3. Research and nature protection agencies use the MS-NFI results, together with NFI field data for analysing the landscape-level biodiversity, as well as the need and possibilities for nature protection, etc.
4. The MS-NFI output maps can serve as forest model for different types of studies, e.g., sampling simulation studies for assessing the efficiencies of different field sampling designs of forest inventories. This type of simulations has been used in the Finnish NFI since 1992 for NFI8 in North Finland (Henttonen 1991; Tomppo et al. 2001b).

For further examples, see Tomppo et al. (2008).

The most serious limitation of the application of MS-NFI method is related to the availability of satellite images. Landsat 7 with ETM+ mitigated the problem temporarily, and the new satellites, e.g., Spot HRV XS and the Indian IRS-1 C LISS offer a more permanent solution. In spite of these achievements, possible cloud coverage restricts the availability of satellite images at the time of field measurements.

The lack of an analytical method for deriving error estimates of an arbitrary area, i.e., groups of pixels, has been considered as a limitation of the k-NN technique.

In the Finnish applications, this problem has been overcome by validating the estimates at the level of groups of municipalities, i.e., in areas for which error estimates can be computed using field data only. Recent progress in analytic error estimation methods offers some hope for a solution to this old problem (McRoberts et al. 2007; Kim and Tomppo 2006).

There are several reasons for the difficulties in deriving an analytical error estimator for an arbitrary area. One reason is the fact that the pixel level residuals depend on the actual value of the variable in question. They are therefore *spatially* correlated. Practical applications have shown that the errors are strongly dependent upon how the reference set for the potential neighbours is restricted, and thus on how a satellite image covers the target area in question. This is a particularly important factor in cases of trend-like changes in forest variables, such as occur over most parts of Finland (Figs. 1 and 2, Appendix 2). There are also many error sources that are not easy to handle in an analytic way. For example, Tomppo et al. (1998b, 2006b) and Katila (2004) list the following error sources:

1. Measurement errors in the field data.
2. Model errors in the field data (volume etc. models for predicting volumes for sample trees).
3. Errors in predicting volumes for tallied trees.
4. The fact that information of an image pixel and the corresponding field information often come from different areas, the pixel size or shape is different from field plot size or shape. Sampling may also be employed when measuring trees on a plot so that the field data that may affect the spectral data are not known. Variations in the ground vegetation composition under a similar growing stock can also cause variations in spectral values not represented in the growing stock.
5. Location error in field plots and corresponding image pixels.
6. Temporal difference in field data and image data. This error occurs in cases where image acquisition from the same time point of field measurements is not possible.
7. The radiometric resolutions of the satellite sensors are not able to capture all variations in the field.
8. Scattering of light by the atmosphere so that the information for a pixel is affected by the areas surrounding the corresponding ground element.
9. Limitations in the imaging techniques, e.g., some sensors interpolate the spectral values in the boundary regions of an image.
10. Limitations in the reference data. The reference field data do not cover the entire variation of the field variables of the target area.
11. Limitations in any ancillary data employed, e.g., numerical map data are out-of-date.
12. In a fragmented landscape, a large number of mixed boundary pixels, pixels including information from several land classes, e.g., forest land, arable land, may decrease the accuracy of the estimates. This problem is also related to the spatial resolution of the remote sensing instrument.
13. The topographic correction model or reflectance model is not well-defined.

At the pixel level, the prediction errors measured with relative RMSE have been high in several multi-source studies, e.g. 50–80% for field plot volume predictions (Tokola et al. 1996; Nilsson 1997; Katila and Tomppo 2001). However, cross-validation probably gives an overestimate of the average error since the target pixel plot includes the location error of the NFI field plot.

It should also be noted that these are average error estimates and the errors depend on the actual value of the variable. It should also be noted that root mean square error based on leave-one-out cross-validation is not a direct error estimate. Kim and Tomppo (2006) presented a model-based method for assessing the uncertainty of pixel-level predictions. A model-based method was also employed by McRoberts et al. (2007) for assessing errors for an area of an arbitrary size.

On the basis of the comparisons of the MS-NFI9 estimates with the estimates calculated from independent data sets, the coefficient of variation for the mean volume of growing stock for areas of about 10,000 ha is of a magnitude of about 5%, and for areas of 100 ha it is about 10–15% (Fig. 4.5a). The errors of the area estimates of different development classes for a total forest land area of 10,000 ha varies between 10–30% when the areas of the classes varied from 500 to 2,800 ha.

An interesting question is whether or not MS-NFI products could be applied in management inventories. These inventories are made for forest holdings and the information unit is the treatment unit what is called a forest stand. Treatment units typically range in size from 0.5 to about 5 ha. Management inventories should provide, in addition to growing stock volume estimates, the silvicultural treatment requirements and cutting possibilities at both the stand- and forest holding levels, as the NFI provides for large areas. The relative RMSE of the volume of growing stock at the stand level is often in management inventories between 15–25%. It is difficult to achieve that accuracy with a satellite image-based MS-NFI, and even more difficult to identify stand-level treatment needs. The MS-NFI estimates are not therefore considered accurate enough for planning silviculture, cutting regimes, and other forestry operations at forest holding level. Nevertheless, the estimates of management inventories are often highly biased so that large area aggregates are not usable as large area forest resource estimates.

In the future, the MS-NFI estimates will be calculated every second year for the greater part of the country and every fourth year for northernmost Finland. The regular up-date of MS-NFI products will increase their applicability and widen the utilisation of the products in forestry. Successive MS-NFI estimates and predictions could also be employed in decreasing the errors through logical inspections of the successive estimates.



# Appendix 1

## Forest Resource

**Table 1** Area and proportion of land classes on forestry land (By forestry centres).

		Forest land		Poorly productive forest land		Unproductive land		Total	
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
<b>Åland</b>									
<i>Municipality</i>									
35	Brändö	2,901	32.9	2,638	29.9	3,290	37.3	8,829	100.0
43	Eckerö	5,515	60.3	2,353	25.7	1,278	14.0	9,146	100.0
60	Finström	6,330	72.8	1,705	19.6	654	7.5	8,690	100.0
62	Föglö	6,196	58.0	2,798	26.2	1,696	15.9	10,691	100.0
65	Geta	3,323	49.2	2,427	35.9	1,006	14.9	6,757	100.0
76	Hammarland	6,953	68.6	2,296	22.7	884	8.7	10,133	100.0
170	Jomala	7,551	77.8	1,529	15.8	629	6.5	9,709	100.0
295	Kumlinge	3,225	40.2	2,305	28.7	2,496	31.1	8,027	100.0
318	Kökar	1,304	27.0	594	12.3	2,933	60.7	4,831	100.0
417	Lemland	6,350	70.9	1,700	19.0	911	10.2	8,960	100.0
438	Lumparland	1,693	61.0	813	29.3	268	9.7	2,774	100.0
478	Mariehamn	459	63.2	172	23.6	96	13.2	727	100.0
736	Saltvik	6,231	55.7	3,463	30.9	1,500	13.4	11,194	100.0
766	Sottunga	874	39.9	519	23.7	794	36.3	2,188	100.0
771	Sund	5,157	63.9	2,233	27.7	678	8.4	8,069	100.0
941	Vårdö	3,732	44.4	2,792	33.2	1,886	22.4	8,411	100.0
<b>Total</b>									
	Multi-source inventory	67,794	56.9	30,338	25.5	21,001	17.6	119,133	100.0
	Field inventory	61,652	52.9	27,326	23.5	27,461	23.6	116,439	100.0
	SE of field inventory	2,597		2,259		2,151		2,854	
<b>Rannikko/Etelärannikko</b>									
<i>Municipality</i>									
40	Dragsfjärd	15,092	69.0	4,109	18.8	2,681	12.3	21,882	100.0
49	Espoo-Esbo	15,256	90.3	1,334	7.9	310	1.8	16,901	100.0
78	Hanko-Hangö	6,845	76.4	1,627	18.2	489	5.5	8,960	100.0

(continued)

**Table 1** (continued)

		Forest land		Poorly productive forest land		Unproductive land		Total	
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
91	Helsinki-Helsingfors	6,526	92.4	270	3.8	269	3.8	7,064	100.0
101	Houtskär-Houtskari	6,782	69.5	2,532	25.9	445	4.6	9,759	100.0
149	Ingå-Inkoo	17,372	82.1	3,313	15.7	467	2.2	21,152	100.0
150	Iniö	3,692	68.6	1,606	29.9	83	1.6	5,381	100.0
220	Karis-Karjaa	11,293	91.5	803	6.5	244	2.0	12,340	100.0
235	Kauniainen-Grankulla	201	90.8	17	7.9	3	1.4	222	100.0
243	Kimito-Kemiö	17,390	83.3	2,574	12.3	914	4.4	20,879	100.0
257	Kirkkonummi-Kyrkslätt	18,714	81.8	3,545	15.5	629	2.8	22,888	100.0
279	Korpo-Korppoo	8,400	59.8	3,535	25.2	2,113	15.0	14,048	100.0
407	Lapinjärvi-Lappträsk	17,240	95.2	770	4.3	109	0.6	18,119	100.0
424	Liljendal	5,759	95.4	266	4.4	11	0.2	6,035	100.0
434	Loviisa-Lovisa	2,747	94.2	148	5.1	22	0.7	2,917	100.0
533	Nagu-Nauvo	13,006	66.9	4,970	25.6	1,458	7.5	19,433	100.0
573	Pargas-Parainen	14,554	80.6	2,748	15.2	767	4.2	18,069	100.0
585	Pernå-Pernaja	25,824	94.0	1,319	4.8	331	1.2	27,473	100.0
606	Pohja-Pojo	14,898	88.4	1,567	9.3	384	2.3	16,849	100.0
638	Porvoo-Borgå	36,430	92.9	2,188	5.6	592	1.5	39,210	100.0
701	Ruotsinpyhtää-Strömfors	16,058	93.8	729	4.3	341	2.0	17,128	100.0
753	Sipoo-Sibbo	19,591	93.7	890	4.3	435	2.1	20,916	100.0
755	Siuntio-Sjundeå	12,412	91.6	985	7.3	158	1.2	13,555	100.0
835	Ekenäs-Tammisaari	43,767	81.0	8,423	15.6	1,863	3.5	54,053	100.0
923	Västanfjärd	5,701	78.4	1,202	16.5	369	5.1	7,273	100.0
Total									
	Multi-source inventory	365,663	84.4	51,791	12.0	15,666	3.6	433,120	100.0
	Field inventory	352,322	82.3	49,011	11.4	26,886	6.3	428,219	100.0
	SE of field inventory	11,149		3,905		2,869		11,261	
<b>Rannikko/Pohjanmaa</b>									
<i>Municipality</i>									
231	Kaskinen-Kaskö	646	87.5	44	6.0	48	6.6	739	100.0
272	Kokkola-Karleby	20,883	91.7	1,203	5.3	677	3.0	22,763	100.0
280	Korsnäs	17,422	92.8	425	2.3	937	5.0	18,784	100.0
287	Kristinestad-Kristiinankaupunki	47,508	94.9	1,529	3.1	1,009	2.0	50,046	100.0
288	Kronoby-Kruunupyy	48,811	89.3	3,694	6.8	2,154	3.9	54,659	100.0

(continued)

**Table 1** (continued)

		Forest land		Poorly productive forest land		Unproductive land		Total	
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
475	Malax-Maalathi	35,308	90.2	1,521	3.9	2,318	5.9	39,148	100.0
499	Korsholm- Mustasaari	53,950	90.7	2,982	5.0	2,577	4.3	59,510	100.0
545	Närpes-Närpiö	64,237	91.7	2,999	4.3	2,787	4.0	70,022	100.0
559	Oravais- Oravainen	12,657	87.6	1,099	7.6	696	4.8	14,452	100.0
598	Jakobstad- Pietarsaari	5,554	91.0	365	6.0	183	3.0	6,103	100.0
599	Pedersöre- Pedersören kunta	54,234	91.4	4,053	6.8	1,066	1.8	59,354	100.0
893	Nykarleby- Uusikaarlepyy	48,853	90.6	3,345	6.2	1,731	3.2	53,928	100.0
905	Vaasa-Vasa	10,008	94.0	269	2.5	370	3.5	10,647	100.0
945	Vörå-Maxmo- Vöyri- Maksamaa	38,777	92.1	1,784	4.2	1,563	3.7	42,123	100.0
<b>Total</b>									
	Multi-source inventory	468,578	91.3	26,101	5.1	18,707	3.6	513,386	100.0
	Field inventory	471,081	89.9	24,259	4.6	28,773	5.5	524,113	100.0
	SE of field inventory	13,025		3,317		3,714		13,665	
<b>Lounais-Suomi</b>									
<i>Municipality</i>									
6	Alastaro	11,929	93.7	401	3.2	398	3.1	12,727	100.0
17	Askainen	2,821	87.7	315	9.8	82	2.6	3,219	100.0
19	Aura	3,955	94.3	153	3.6	85	2.0	4,193	100.0
50	Eura	28,339	93.6	1,009	3.3	929	3.1	30,276	100.0
51	Eurajoki	21,612	94.3	678	3.0	620	2.7	22,910	100.0
73	Halikko	17,931	92.2	1,159	6.0	365	1.9	19,455	100.0
79	Harjavalta	7,124	90.5	295	3.8	451	5.7	7,871	100.0
99	Honkajoki	21,286	87.4	1,369	5.6	1,713	7.0	24,368	100.0
102	Huittinen	19,817	89.0	692	3.1	1,750	7.9	22,259	100.0
181	Jämijärvi	12,659	93.0	588	4.3	363	2.7	13,610	100.0
202	Kaarina	2,133	85.9	302	12.2	49	2.0	2,484	100.0
214	Kankaanpää	45,693	89.9	2,421	4.8	2,696	5.3	50,809	100.0
230	Karvia	32,087	85.6	2,419	6.5	2,965	7.9	37,471	100.0
252	Kiikala	14,036	93.1	717	4.8	322	2.1	15,075	100.0
254	Kiikoinen	9,179	94.6	283	2.9	239	2.5	9,701	100.0
259	Kisko	16,899	92.8	803	4.4	501	2.8	18,203	100.0
262	Kiukainen	6,792	96.6	123	1.8	120	1.7	7,035	100.0
271	Kokemäki	28,774	92.7	850	2.7	1,429	4.6	31,053	100.0
284	Koski Tl	7,954	96.2	217	2.6	100	1.2	8,271	100.0
304	Kustavi	9,075	76.5	2,599	21.9	190	1.6	11,864	100.0

(continued)

**Table 1** (continued)

		Forest land		Poorly productive forest land		Unproductive land		Total	
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
319	Köyliö	14,728	89.9	874	5.3	774	4.7	16,376	100.0
400	Laitila	32,419	90.9	1,666	4.7	1,577	4.4	35,661	100.0
406	Lappi	13,377	93.4	666	4.7	284	2.0	14,327	100.0
413	Lavia	23,035	94.0	795	3.2	670	2.7	24,500	100.0
419	Lemu	1,796	89.1	152	7.5	69	3.4	2,016	100.0
423	Lieto	8,849	93.2	546	5.8	105	1.1	9,500	100.0
430	Loimaa	17,811	92.8	642	3.3	734	3.8	19,186	100.0
442	Luvia	11,884	97.7	137	1.1	143	1.2	12,164	100.0
480	Marttila	9,100	90.9	365	3.7	545	5.5	10,010	100.0
481	Masku	4,264	87.0	419	8.6	220	4.5	4,903	100.0
482	Mellilä	3,567	88.9	246	6.1	199	5.0	4,013	100.0
484	Merikarvia	32,445	90.8	779	2.2	2,500	7.0	35,724	100.0
485	Merimasku	2,657	85.1	422	13.5	42	1.3	3,121	100.0
501	Muurla	4,156	93.4	221	5.0	74	1.7	4,451	100.0
503	Mynämäki	31,242	89.6	1,938	5.6	1,704	4.9	34,884	100.0
529	Naantali	2,371	85.1	376	13.5	40	1.4	2,787	100.0
531	Nakkila	8,730	96.4	160	1.8	167	1.8	9,056	100.0
537	Noormarkku	24,421	93.6	837	3.2	831	3.2	26,089	100.0
538	Nousiainen	10,782	89.8	739	6.2	486	4.1	12,008	100.0
561	Oripää	5,558	91.1	216	3.5	325	5.3	6,099	100.0
577	Paimio	11,144	89.2	1,172	9.4	172	1.4	12,488	100.0
586	Perniö	23,117	92.0	1,534	6.1	488	1.9	25,138	100.0
587	Pertteli	6,626	94.6	299	4.3	79	1.1	7,003	100.0
602	Piikkiö	3,813	88.5	433	10.1	62	1.4	4,309	100.0
608	Pomarkku	22,706	91.5	825	3.3	1,283	5.2	24,815	100.0
609	Pori	28,219	95.8	516	1.8	709	2.4	29,443	100.0
631	Pyhäranta	9,582	94.3	412	4.1	164	1.6	10,158	100.0
636	Pöytyä	20,526	91.1	930	4.1	1,081	4.8	22,537	100.0
680	Raisio	1,852	87.1	227	10.7	48	2.3	2,127	100.0
684	Rauma	17,904	92.8	1,045	5.4	343	1.8	19,292	100.0
704	Rusko	2,262	91.6	162	6.6	45	1.8	2,469	100.0
705	Rymättylä	7,163	75.3	2,241	23.5	114	1.2	9,519	100.0
734	Salo	7,403	94.9	317	4.1	80	1.0	7,800	100.0
738	Sauvo	11,946	88.0	1,362	10.0	265	2.0	13,573	100.0
747	Siikainen	33,928	88.6	1,199	3.1	3,159	8.3	38,286	100.0
761	Somero	33,174	95.6	887	2.6	659	1.9	34,720	100.0
776	Suomusjärvi	10,927	93.4	559	4.8	211	1.8	11,697	100.0
783	Säkylä	9,646	92.5	608	5.8	178	1.7	10,432	100.0
784	Särkisalo-Finby	5,314	91.5	406	7.0	86	1.5	5,807	100.0
833	Taivassalo	6,217	81.3	1,310	17.1	118	1.6	7,645	100.0
838	Tarvasjoki	4,357	96.2	130	2.9	41	0.9	4,528	100.0
853	Turku-Åbo	8,802	86.2	1,128	11.0	285	2.8	10,215	100.0
886	Ulvila	27,364	93.4	1,071	3.7	870	3.0	29,305	100.0
895	Uusikaupunki	28,411	87.9	2,939	9.1	979	3.0	32,329	100.0
906	Vahto	4,177	89.0	220	4.7	298	6.4	4,695	100.0

(continued)

**Table 1** (continued)

		Forest land		Poorly productive forest land		Unproductive land		Total	
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
918	Vehmaa	9,167	89.7	818	8.0	236	2.3	10,221	100.0
920	Velkua	1,684	72.9	605	26.2	21	0.9	2,310	100.0
979	Yläne	23,763	88.6	1,692	6.3	1,365	5.1	26,819	100.0
<b>Total</b>									
	Multi-source inventory	975,878	91.1	54,820	5.1	40,410	3.8	1,071,108	100.0
	Field inventory	982,958	90.7	61,728	5.7	39,131	3.6	1,083,816	100.0
	SE of field inventory	17,233		5,090		4,851		18,325	
<b>Häme-Uusimaa</b>									
<i>Municipality</i>									
15	Artjärvi	9,454	96.0	338	3.4	57	0.6	9,850	100.0
16	Asikkala	43,000	98.0	610	1.4	271	0.6	43,881	100.0
18	Askola	12,160	97.8	193	1.6	76	0.6	12,429	100.0
61	Forssa	13,752	96.4	187	1.3	321	2.3	14,259	100.0
81	Hartola	43,942	97.8	360	0.8	613	1.4	44,915	100.0
82	Hattula	25,321	95.7	457	1.7	694	2.6	26,472	100.0
83	Hauho	24,577	98.0	239	1.0	273	1.1	25,088	100.0
86	Hausjärvi	20,066	97.3	351	1.7	213	1.0	20,630	100.0
98	Hollola	29,714	97.9	273	0.9	363	1.2	30,350	100.0
103	Humppila	7,185	96.2	150	2.0	132	1.8	7,467	100.0
106	Hyvinkää	19,441	96.6	435	2.2	255	1.3	20,131	100.0
109	Hämeenlinna	10,732	98.1	112	1.0	95	0.9	10,940	100.0
111	Heinola	56,862	97.2	1,311	2.2	340	0.6	58,514	100.0
165	Janakkala	33,594	97.2	469	1.4	502	1.5	34,564	100.0
169	Jokioinen	8,022	97.5	52	0.6	158	1.9	8,232	100.0
186	Järvenpää	1,497	97.5	24	1.6	14	0.9	1,535	100.0
210	Kalvola	22,318	98.0	194	0.9	254	1.1	22,767	100.0
223	Karjalohja	7,612	95.8	213	2.7	122	1.5	7,948	100.0
224	Karkkila	16,205	98.6	126	0.8	108	0.7	16,439	100.0
245	Kerava	1,459	98.3	17	1.1	8	0.5	1,484	100.0
283	Hämeenkoski	11,927	98.7	64	0.5	90	0.7	12,080	100.0
316	Kärkölä	13,607	96.8	237	1.7	213	1.5	14,056	100.0
398	Lahti	7,922	96.9	131	1.6	120	1.5	8,172	100.0
401	Lammi	39,244	98.3	334	0.8	363	0.9	39,941	100.0
433	Loppi	41,559	98.1	448	1.1	368	0.9	42,375	100.0
444	Lohja-Lojo	16,183	98.8	108	0.7	90	0.6	16,382	100.0
504	Myrskylä-Mörskom	12,366	96.7	304	2.4	117	0.9	12,787	100.0
505	Mäntsälä	33,332	97.0	612	1.8	436	1.3	34,380	100.0
532	Nastola	22,673	95.7	856	3.6	176	0.7	23,705	100.0
540	Nummi-Pusula	29,559	98.4	263	0.9	213	0.7	30,035	100.0
543	Nurmijärvi	17,836	97.6	338	1.9	107	0.6	18,280	100.0
560	Orimattila	34,803	96.6	776	2.2	439	1.2	36,018	100.0

(continued)

**Table 1** (continued)

	Forest land		Poorly productive forest land		Unproductive land		Total	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
	611 Pornainen	8,523	97.4	145	1.7	81	0.9	8,749
616 Pukkila	7,463	97.6	106	1.4	75	1.0	7,644	100.0
692 Renko	18,879	96.5	340	1.7	352	1.8	19,570	100.0
694 Riihimäki	6,719	97.7	108	1.6	50	0.7	6,878	100.0
737 Sammatti	4,475	96.7	109	2.4	45	1.0	4,629	100.0
781 Sysmä	52,235	98.8	288	0.5	361	0.7	52,884	100.0
834 Tammela	43,777	92.5	846	1.8	2,689	5.7	47,312	100.0
855 Tuulos	11,998	97.9	151	1.2	110	0.9	12,259	100.0
858 Tuusula	10,554	97.5	197	1.8	69	0.6	10,820	100.0
927 Vihti	32,009	98.5	336	1.0	148	0.5	32,492	100.0
981 Ypäjä	7,925	97.1	105	1.3	131	1.6	8,161	100.0
<b>Total</b>								
Multi-source inventory	936,899	97.4	13,576	1.4	11,960	1.2	962,434	100.0
Field inventory	942,035	97.6	12,070	1.3	11,228	1.2	965,333	100.0
SE of field inventory	15,514		2,000		2,647		15,603	
<b>Kaakkois-Suomi</b>								
<i>Municipality</i>								
44 Elimäki	19,440	98.0	317	1.6	82	0.4	19,840	100.0
75 Hamina	43,769	96.0	1,106	2.4	720	1.6	45,595	100.0
142 Iitti	39,462	97.3	810	2.0	274	0.7	40,546	100.0
153 Imatra	9,564	99.0	58	0.6	42	0.4	9,664	100.0
163 Jaala	34,776	97.2	661	1.9	330	0.9	35,767	100.0
173 Joutseno	20,147	99.0	122	0.6	89	0.4	20,358	100.0
285 Kotka	17,930	94.3	685	3.6	397	2.1	19,012	100.0
286 Kouvola	2,121	97.6	29	1.3	24	1.1	2,174	100.0
306 Kuusankoski	6,847	97.9	92	1.3	58	0.8	6,998	100.0
405 Lappeenranta	53,707	98.5	331	0.6	468	0.9	54,506	100.0
416 Lemi	15,824	98.6	119	0.7	110	0.7	16,052	100.0
441 Luumäki	58,765	96.8	1,010	1.7	911	1.5	60,686	100.0
489 Miehikkälä	31,786	97.3	482	1.5	413	1.3	32,680	100.0
580 Parikkala	42,033	98.8	240	0.6	257	0.6	42,530	100.0
624 Pyhtää-Pyttis	20,329	92.5	1,072	4.9	585	2.7	21,986	100.0
689 Rautjärvi	28,004	99.2	143	0.5	88	0.3	28,235	100.0
700 Ruokolahti	78,786	98.2	1,016	1.3	416	0.5	80,217	100.0
739 Savitaipale	41,818	97.2	749	1.7	458	1.1	43,025	100.0
754 Anjalankoski	48,060	95.1	1,242	2.5	1,230	2.4	50,531	100.0
775 Suomenniemi	24,254	97.2	485	1.9	216	0.9	24,954	100.0
831 Taipalsaari	27,621	98.6	274	1.0	133	0.5	28,028	100.0
909 Valkeala	63,518	96.5	1,351	2.1	960	1.5	65,829	100.0
935 Virolahti	26,409	95.6	641	2.3	580	2.1	27,630	100.0
978 Ylämaa	30,442	96.8	460	1.5	550	1.8	31,452	100.0

(continued)

**Table 1** (continued)

	Forest land		Poorly productive forest land		Unproductive land		Total	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
<b>Total</b>								
Multi-source inventory	785,412	97.2	13,495	1.7	9,390	1.2	808,296	100.0
Field inventory	779,945	96.8	12,037	1.5	13,405	1.7	805,387	100.0
SE of field inventory	11,763		2,319		2,356		11,819	
<b>Pirkanmaa</b>								
<i>Municipality</i>								
20 Akaa	5,498	97.5	50	0.9	91	1.6	5,639	100.0
108 Hämeenkyrö	31,776	97.8	493	1.5	220	0.7	32,489	100.0
143 Ikaalinen	55,650	96.3	1,340	2.3	824	1.4	57,814	100.0
177 Juupajoki	20,120	97.9	253	1.2	183	0.9	20,555	100.0
211 Kangasala	35,165	98.4	358	1.0	222	0.6	35,746	100.0
250 Kihniö	26,950	93.0	1,053	3.6	986	3.4	28,989	100.0
289 Kuhmalahti	12,971	98.1	147	1.1	100	0.8	13,218	100.0
303 Kuru	59,309	95.1	1,525	2.5	1,537	2.5	62,371	100.0
310 Kylmäkoski	11,637	98.2	126	1.1	89	0.8	11,852	100.0
418 Lempäälä	18,902	98.9	104	0.5	116	0.6	19,121	100.0
493 Mouhijärvi	17,786	98.2	229	1.3	107	0.6	18,122	100.0
506 Mänttä	4,617	98.4	38	0.8	39	0.8	4,694	100.0
536 Nokia	20,725	98.8	165	0.8	83	0.4	20,973	100.0
562 Orivesi	62,179	98.3	647	1.0	459	0.7	63,285	100.0
581 Parkano	63,177	89.9	3,829	5.5	3,275	4.7	70,281	100.0
604 Pirkkala	5,466	99.0	29	0.5	28	0.5	5,523	100.0
619 Punkalaidun	18,914	93.8	631	3.1	629	3.1	20,174	100.0
635 Pälkäne	41,958	98.6	392	0.9	226	0.5	42,576	100.0
702 Ruovesi	62,002	97.0	916	1.4	986	1.5	63,904	100.0
837 Tampere	37,188	98.5	313	0.8	249	0.7	37,750	100.0
887 Urjala	31,101	96.5	588	1.8	538	1.7	32,227	100.0
908 Valkeakoski	17,468	98.2	156	0.9	157	0.9	17,781	100.0
912 Vammala	56,268	97.7	814	1.4	520	0.9	57,603	100.0
922 Vesilahti	21,435	98.6	184	0.9	123	0.6	21,742	100.0
933 Vilppula	38,037	98.1	389	1.0	333	0.9	38,759	100.0
936 Virrat	91,247	94.0	2,613	2.7	3,262	3.4	97,122	100.0
980 Ylöjärvi	29,092	98.2	307	1.0	242	0.8	29,641	100.0
988 Äetsä	16,149	98.2	214	1.3	89	0.5	16,452	100.0
<b>Total</b>								
Multi-source inventory	912,787	96.5	17,906	1.9	15,712	1.7	946,405	100.0
Field inventory	902,649	96.6	15,425	1.6	16,802	1.8	934,877	100.0
SE of field inventory	13,335		2,149		3,418		13,314	
<b>Etelä-Savo</b>								
<i>Municipality</i>								
46 Enonkoski	28,556	99.1	149	0.5	102	0.4	28,806	100.0
90 Heinävesi	94,851	99.1	582	0.6	327	0.3	95,760	100.0

(continued)

**Table 1** (continued)

	Forest land		Poorly productive forest land		Unproductive land		Total		
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
171	Joroinen	45,972	97.6	826	1.8	330	0.7	47,127	100.0
178	Juva	98,751	97.3	1,982	2.0	727	0.7	101,460	100.0
213	Kangasniemi	91,338	97.6	1,568	1.7	682	0.7	93,587	100.0
246	Kerimäki	49,494	97.6	721	1.4	495	1.0	50,711	100.0
491	Mikkeli	141,769	96.6	3,141	2.1	1,797	1.2	146,707	100.0
507	Mäntyharju	84,632	97.7	1,415	1.6	554	0.6	86,601	100.0
588	Pertunmaa	31,954	97.9	364	1.1	323	1.0	32,642	100.0
593	Pieksämäki	133,880	96.3	3,332	2.4	1,884	1.4	139,096	100.0
618	Punkaharju	43,065	98.6	326	0.8	283	0.7	43,674	100.0
623	Puumala	71,036	97.4	1,667	2.3	243	0.3	72,946	100.0
681	Rantasalmi	46,178	98.4	330	0.7	437	0.9	46,946	100.0
696	Ristiina	48,545	97.8	801	1.6	294	0.6	49,640	100.0
740	Savonlinna	70,641	98.2	944	1.3	340	0.5	71,925	100.0
741	Savonranta	34,710	99.2	101	0.3	195	0.6	35,005	100.0
768	Sulkava	50,778	98.3	616	1.2	282	0.6	51,676	100.0
Total									
	Multi-source inventory	1,206,273	97.6	19,520	1.6	9,697	0.8	1,235,489	100.0
	Field inventory	1,199,391	97.7	20,291	1.7	8,339	0.7	1,228,021	100.0
	SE of field inventory	9,318		2,779		2,075		9,021	
<b>Etelä-Pohjanmaa</b>									
<i>Municipality</i>									
4	Alahärmä	18,868	85.3	2,203	10.0	1,058	4.8	22,129	100.0
5	Alajärvi	50,848	87.7	4,671	8.1	2,474	4.3	57,992	100.0
10	Alavus	53,169	89.9	3,677	6.2	2,303	3.9	59,149	100.0
52	Evijärvi	24,776	88.6	2,008	7.2	1,177	4.2	27,961	100.0
74	Halsua	27,614	78.4	3,622	10.3	3,979	11.3	35,215	100.0
95	Himanka	16,645	91.6	916	5.0	612	3.4	18,173	100.0
145	Ilmajoki	34,858	93.6	1,293	3.5	1,086	2.9	37,237	100.0
151	Isojoki	46,773	86.2	4,317	8.0	3,175	5.9	54,264	100.0
152	Isokyrö	19,061	89.7	1,222	5.8	970	4.6	21,253	100.0
164	Jalasjärvi	50,529	90.4	3,477	6.2	1,881	3.4	55,887	100.0
175	Jurva	31,221	90.9	1,723	5.0	1,409	4.1	34,354	100.0
217	Kannus	28,294	89.7	1,886	6.0	1,377	4.4	31,556	100.0
218	Karjajoki	12,098	91.3	866	6.5	292	2.2	13,257	100.0
232	Kauhajoki	82,645	85.2	9,413	9.7	4,940	5.1	96,998	100.0
233	Kauhava	28,501	91.4	1,842	5.9	831	2.7	31,175	100.0
236	Kaustinen	23,201	80.8	3,061	10.7	2,437	8.5	28,699	100.0
281	Kortesjärvi	22,206	90.0	1,521	6.2	951	3.9	24,678	100.0
300	Kuortane	31,586	91.2	2,056	5.9	976	2.8	34,618	100.0
301	Kurikka	27,280	92.4	1,574	5.3	668	2.3	29,521	100.0
315	Kälviä	45,085	78.5	5,935	10.3	6,421	11.2	57,440	100.0
399	Laihia	32,596	88.4	1,785	4.8	2,483	6.7	36,864	100.0

(continued)



**Table 1** (continued)

	Forest land		Poorly productive forest land		Unproductive land		Total		
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
403	Lappajärvi	28,770	88.7	2,166	6.7	1,510	4.7	32,446	100.0
408	Lapua	42,756	89.1	3,346	7.0	1,891	3.9	47,992	100.0
414	Lehtimäki	18,070	82.9	2,393	11.0	1,332	6.1	21,794	100.0
421	Lehtijärvi	33,203	76.6	4,570	10.5	5,595	12.9	43,368	100.0
429	Lohtaja	28,904	87.0	2,997	9.0	1,320	4.0	33,220	100.0
544	Nurmo	23,187	88.1	1,756	6.7	1,371	5.2	26,313	100.0
584	Perho	52,997	79.8	4,551	6.9	8,846	13.3	66,394	100.0
743	Seinäjäoki	34,695	89.6	2,219	5.7	1,832	4.7	38,745	100.0
759	Soini	40,570	86.9	3,576	7.7	2,550	5.5	46,696	100.0
846	Teuva	35,878	88.4	2,768	6.8	1,931	4.8	40,577	100.0
849	Toholampi	36,130	79.9	4,254	9.4	4,840	10.7	45,224	100.0
863	Töysä	21,314	93.5	1,062	4.7	408	1.8	22,785	100.0
885	Ullava	10,740	83.5	1,160	9.0	964	7.5	12,864	100.0
924	Veteli	32,791	80.6	4,151	10.2	3,761	9.2	40,703	100.0
934	Vimpeli	18,871	85.5	1,837	8.3	1,367	6.2	22,075	100.0
942	Vähäkyrö	8,897	96.2	194	2.1	160	1.7	9,252	100.0
971	Ylihärmä	6,822	83.1	1,004	12.2	384	4.7	8,210	100.0
975	Ylistaro	27,805	91.9	1,772	5.9	680	2.3	30,256	100.0
989	Ähtäri	63,995	93.0	3,134	4.6	1,667	2.4	68,795	100.0
<b>Total</b>									
	Multi-source inventory	1,274,246	86.9	107,981	7.4	83,904	5.7	1,466,131	100.0
	Field inventory	1,273,958	86.9	100,659	6.9	91,430	6.2	1,466,046	100.0
	SE of field inventory	21,274		6,353		8,630		22,397	
<b>Keski-Suomi</b>									
<i>Municipality</i>									
77	Hankasalmi	46,133	99.5	172	0.4	54	0.1	46,358	100.0
172	Joutsa	40,684	99.2	287	0.7	29	0.1	41,000	100.0
179	Jyväskylä	7,060	99.4	37	0.5	6	0.1	7,103	100.0
180	Jyväskylän mlk	35,511	99.2	236	0.7	38	0.1	35,784	100.0
182	Jämsä	95,834	98.5	915	0.9	505	0.5	97,254	100.0
183	Jämsänkoski	34,037	98.4	452	1.3	114	0.3	34,604	100.0
216	Kannonkoski	39,056	98.5	590	1.5	16	0.0	39,662	100.0
226	Karstula	70,804	93.6	3,301	4.4	1,524	2.0	75,630	100.0
249	Keuruu	107,448	97.1	2,413	2.2	775	0.7	110,636	100.0
256	Kinnula	37,842	92.1	2,495	6.1	757	1.8	41,094	100.0
265	Kivijärvi	41,265	94.4	1,733	4.0	719	1.6	43,717	100.0
275	Konnevesi	43,657	99.2	244	0.6	97	0.2	43,998	100.0
277	Korpilahti	51,878	99.3	332	0.6	46	0.1	52,257	100.0
291	Kuhmoinen	56,902	98.8	667	1.2	12	0.0	57,581	100.0
312	Kyyjärvi	32,016	85.6	3,713	9.9	1,687	4.5	37,416	100.0
410	Laukaa	49,309	99.3	296	0.6	34	0.1	49,639	100.0

(continued)

**Table 1** (continued)

		Forest land		Poorly productive forest land		Unproductive land		Total	
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
415	Leivonmäki	31,627	97.0	778	2.4	204	0.6	32,609	100.0
435	Luhanka	17,989	99.3	112	0.6	18	0.1	18,120	100.0
495	Multia	63,567	95.9	1,962	3.0	722	1.1	66,251	100.0
500	Muurame	11,614	99.4	60	0.5	9	0.1	11,683	100.0
592	Petäjävesi	39,121	98.7	414	1.0	121	0.3	39,657	100.0
601	Pihtipudas	88,388	95.3	3,404	3.7	989	1.1	92,782	100.0
633	Pylkönmäki	29,935	95.0	1,116	3.5	449	1.4	31,500	100.0
729	Saarijärvi	73,629	98.5	835	1.1	278	0.4	74,742	100.0
850	Toivakka	30,365	99.3	186	0.6	24	0.1	30,575	100.0
892	Uurainen	29,541	98.2	412	1.4	123	0.4	30,076	100.0
931	Viitasaari	106,801	98.5	1,319	1.2	284	0.3	108,403	100.0
992	Äänekoski	73,017	98.8	726	1.0	147	0.2	73,890	100.0
<b>Total</b>									
	Multi-source inventory	1,385,031	97.3	29,209	2.1	9,781	0.7	1,424,021	100.0
	Field inventory	1,374,074	96.4	35,528	2.5	15,652	1.1	1,425,253	100.0
	SE of field inventory	12,911		4,205		3,122		12,769	
<b>Pohjois-Savo</b>									
<i>Municipality</i>									
140	Iisalmi	56,313	98.9	495	0.9	144	0.3	56,951	100.0
174	Juankoski	36,552	98.5	320	0.9	234	0.6	37,106	100.0
204	Kaavi	58,399	98.1	708	1.2	446	0.7	59,554	100.0
227	Karttula	40,174	99.0	242	0.6	154	0.4	40,569	100.0
239	Keitele	40,129	97.8	649	1.6	267	0.7	41,044	100.0
263	Kiuruvesi	100,047	96.5	2,248	2.2	1,337	1.3	103,631	100.0
297	Kuopio	91,494	99.4	351	0.4	182	0.2	92,026	100.0
402	Lapinlahti	46,826	98.3	492	1.0	327	0.7	47,645	100.0
420	Leppävirta	95,872	99.3	293	0.3	384	0.4	96,550	100.0
476	Maaninka	34,778	99.0	195	0.6	143	0.4	35,116	100.0
534	Nilsjä	56,139	98.1	627	1.1	485	0.8	57,251	100.0
595	Pielavesi	94,608	97.5	1,510	1.6	956	1.0	97,074	100.0
686	Rautalampi	44,966	99.1	221	0.5	210	0.5	45,397	100.0
687	Rautavaara	95,281	90.9	5,019	4.8	4,547	4.3	104,847	100.0
749	Siilinjärvi	27,982	99.1	113	0.4	137	0.5	28,232	100.0
762	Sonkajärvi	121,388	93.0	5,167	4.0	3,912	3.0	130,467	100.0
778	Suonenjoki	60,436	99.1	204	0.3	336	0.6	60,975	100.0
844	Tervo	29,038	99.2	109	0.4	119	0.4	29,266	100.0
857	Tuusniemi	45,716	98.9	279	0.6	207	0.4	46,201	100.0
915	Varkaus	31,767	99.0	139	0.4	180	0.6	32,087	100.0
916	Varpaisjärvi	38,593	97.4	596	1.5	434	1.1	39,623	100.0
921	Vesanto	34,898	99.3	159	0.5	86	0.2	35,143	100.0
925	Vieremä	73,791	95.8	1,896	2.5	1,324	1.7	77,011	100.0

(continued)

**Table 1** (continued)

	Forest land		Poorly productive forest land		Unproductive land		Total	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
<b>Total</b>								
Multi-source inventory	1,355,185	97.2	22,031	1.6	16,550	1.2	1,393,766	100.0
Field inventory	1,336,144	96.5	23,610	1.7	24,479	1.8	1,384,232	100.0
SE of field inventory	12,879		2,605		3,615		12,456	
<b>Pohjois-Karjala</b>								
<i>Municipality</i>								
45 Eno	81,974	95.3	2,230	2.6	1,788	2.1	85,991	100.0
146 Ilomantsi	222,086	86.0	15,562	6.0	20,754	8.0	258,402	100.0
167 Joensuu	100,525	96.7	1,836	1.8	1,546	1.5	103,907	100.0
176 Juuka	129,651	95.1	4,316	3.2	2,357	1.7	136,324	100.0
248 Kesälahti	32,857	98.2	368	1.1	225	0.7	33,450	100.0
260 Kitee	70,282	98.1	688	1.0	663	0.9	71,634	100.0
276 Kontiolahti	66,689	97.5	946	1.4	756	1.1	68,391	100.0
309 Outokumpu	35,615	97.1	397	1.1	667	1.8	36,679	100.0
422 Lieksa	293,102	92.5	11,971	3.8	11,704	3.7	316,777	100.0
426 Liperi	56,182	99.1	340	0.6	190	0.3	56,712	100.0
541 Nurmes	138,077	94.8	5,141	3.5	2,493	1.7	145,711	100.0
607 Polvijärvi	63,658	95.6	1,312	2.0	1,600	2.4	66,570	100.0
632 Pyhäselkä	21,200	98.4	192	0.9	151	0.7	21,543	100.0
707 Rääkkylä	34,242	96.8	518	1.5	616	1.7	35,376	100.0
848 Tohmajärvi	67,974	97.3	1,003	1.4	895	1.3	69,872	100.0
911 Valtimo	68,064	95.3	2,278	3.2	1,050	1.5	71,392	100.0
<b>Total</b>								
Multi-source inventory	1,482,179	93.9	49,097	3.1	47,457	3.0	1,578,733	100.0
Field inventory	1,490,930	94.0	45,976	2.9	49,117	3.1	1,586,023	100.0
SE of field inventory	13,336		3,844		5,838		12,377	
<b>Kainuu</b>								
<i>Municipality</i>								
105 Hyrynsalmi	119,104	87.4	9,767	7.2	7,349	5.4	136,219	100.0
205 Kajaani	147,909	87.8	13,196	7.8	7,353	4.4	168,458	100.0
290 Kuhmo	406,629	87.4	31,743	6.8	26,809	5.8	465,180	100.0
578 Paltamo	79,873	93.6	3,289	3.9	2,154	2.5	85,315	100.0
620 Puolanka	201,099	84.2	22,551	9.4	15,221	6.4	238,870	100.0
697 Ristijärvi	72,737	91.3	3,754	4.7	3,212	4.0	79,703	100.0
765 Sotkamo	228,929	92.8	11,138	4.5	6,692	2.7	246,759	100.0
777 Suomussalmi	423,176	83.1	49,502	9.7	36,770	7.2	509,448	100.0
785 Vaala	91,195	76.4	15,677	13.1	12,438	10.4	119,310	100.0

(continued)

**Table 1** (continued)

	Forest land		Poorly productive forest land		Unproductive land		Total	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
<b>Total</b>								
Multi-source inventory	1,770,651	86.4	160,616	7.8	117,998	5.8	2,049,264	100.0
Field inventory	1,753,669	86.0	157,637	7.7	127,444	6.3	2,038,750	100.0
SE of field inventory	13,702		7,859		8,308		8,463	
<b>Pohjois-Pohjanmaa</b>								
<i>Municipality</i>								
9 Alavieska	16,007	90.1	1,028	5.8	723	4.1	17,758	100.0
69 Haapajärvi	57,768	91.0	3,491	5.5	2,221	3.5	63,480	100.0
71 Haapavesi	74,839	88.1	5,990	7.1	4,171	4.9	85,000	100.0
72 Hailuoto	13,950	83.3	1,142	6.8	1,662	9.9	16,754	100.0
84 Haukipudas	30,489	83.2	2,982	8.1	3,174	8.7	36,645	100.0
139 Ii	107,809	77.1	12,799	9.2	19,171	13.7	139,779	100.0
208 Kalajoki	46,925	89.5	3,685	7.0	1,794	3.4	52,404	100.0
244 Kempele	7,050	74.3	1,105	11.7	1,331	14.0	9,485	100.0
247 Kestilä	41,649	78.3	6,392	12.0	5,134	9.7	53,174	100.0
255 Kiiminki	23,298	82.5	2,457	8.7	2,491	8.8	28,246	100.0
305 Kuusamo	355,247	74.8	63,800	13.4	56,187	11.8	475,234	100.0
317 Kärsämäki	51,559	89.0	4,444	7.7	1,951	3.4	57,954	100.0
425 Liminka	35,995	69.6	8,055	15.6	7,693	14.9	51,743	100.0
436 Lumijoki	12,948	84.0	1,332	8.6	1,135	7.4	15,415	100.0
483 Merijärvi	17,698	94.1	762	4.1	346	1.8	18,806	100.0
494 Muhos	47,923	73.9	7,839	12.1	9,132	14.1	64,894	100.0
535 Nivala	30,348	94.6	1,033	3.2	708	2.2	32,090	100.0
563 Oulainen	44,748	92.1	2,458	5.1	1,386	2.9	48,593	100.0
564 Oulu	19,791	88.6	1,165	5.2	1,379	6.2	22,334	100.0
567 Oulunsalo	10,653	78.2	1,467	10.8	1,500	11.0	13,620	100.0
603 Piippola	35,071	85.8	3,430	8.4	2,389	5.8	40,890	100.0
615 Pudasjärvi	368,924	68.5	66,384	12.3	103,271	19.2	538,578	100.0
617 Pulkkila	28,916	89.5	2,008	6.2	1,398	4.3	32,322	100.0
625 Pyhäjoki	41,729	90.9	2,488	5.4	1,704	3.7	45,920	100.0
626 Pyhäsalmi	104,227	90.7	6,063	5.3	4,604	4.0	114,895	100.0
630 Pyhäntä	59,652	79.6	8,047	10.7	7,222	9.6	74,921	100.0
678 Raahе	38,450	90.1	2,398	5.6	1,827	4.3	42,675	100.0
682 Rantsila	50,060	79.2	7,864	12.4	5,270	8.3	63,194	100.0
691 Reisjärvi	34,263	89.1	2,926	7.6	1,257	3.3	38,446	100.0
746 Sievi	53,158	80.7	7,511	11.4	5,167	7.9	65,835	100.0
748 Siikajoki	68,211	81.2	8,675	10.3	7,097	8.5	83,982	100.0
832 Taivalkoski	182,232	77.1	28,464	12.1	25,541	10.8	236,237	100.0
859 Tyrnävä	26,129	75.2	5,340	15.4	3,268	9.4	34,737	100.0
889 Utajärvi	106,956	69.2	19,844	12.8	27,855	18.0	154,655	100.0
926 Vihanti	33,232	84.1	4,049	10.2	2,253	5.7	39,534	100.0
972 Yli-Ii	51,073	74.7	7,195	10.5	10,098	14.8	68,366	100.0
973 Ylikiminki	66,971	73.3	9,106	10.0	15,252	16.7	91,329	100.0
977 Ylivieska	40,505	91.1	2,646	6.0	1,328	3.0	44,478	100.0

(continued)

**Table 1** (continued)

	Forest land		Poorly productive forest land		Unproductive land		Total		
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
<b>Total</b>									
Multi-source inventory	2,436,451	78.2	327,862	10.5	350,091	11.2	3,114,405	100.0	
Field inventory	2,410,598	77.7	362,232	11.7	330,258	10.6	3,103,088	100.0	
SE of field inventory	27,051		14,240		17,911		21,447		
<b>Lapland</b>									
<i>Municipality</i>									
47 Enontekiö	94,334	11.9	174,924	22.0	524,555	66.1	793,812	100.0	
148 Inari	712,116	47.7	409,999	27.4	371,965	24.9	1,494,081	100.0	
240 Kemi	6,409	89.9	221	3.1	503	7.1	7,132	100.0	
241 Keminmaa	45,121	78.6	4,290	7.5	8,018	14.0	57,429	100.0	
261 Kittilä	466,995	58.4	148,501	18.6	183,562	23.0	799,058	100.0	
273 Kolari	173,677	70.2	46,166	18.7	27,434	11.1	247,278	100.0	
320 Kemijärvi	252,360	74.6	56,296	16.6	29,755	8.8	338,410	100.0	
498 Muonio	121,167	67.7	30,295	16.9	27,511	15.4	178,973	100.0	
583 Pelkosenniemi	121,006	67.3	35,091	19.5	23,644	13.2	179,741	100.0	
614 Posio	207,573	71.0	49,127	16.8	35,699	12.2	292,399	100.0	
683 Ranua	201,135	60.8	70,912	21.4	58,910	17.8	330,958	100.0	
698 Rovaniemi	559,792	76.9	108,602	14.9	59,468	8.2	727,862	100.0	
732 Salla	381,918	68.4	111,967	20.0	64,904	11.6	558,788	100.0	
742 Savukoski	439,951	69.9	118,552	18.8	71,041	11.3	629,544	100.0	
751 Simo	89,850	64.7	22,628	16.3	26,329	19.0	138,806	100.0	
758 Sodankylä	668,146	57.5	215,789	18.6	278,542	24.0	1,162,478	100.0	
845 Tervola	109,404	74.5	22,634	15.4	14,913	10.2	146,951	100.0	
851 Tornio	82,653	78.9	11,550	11.0	10,565	10.1	104,769	100.0	
854 Pello	134,644	80.5	23,173	13.9	9,532	5.7	167,350	100.0	
890 Utsjoki	6,297	1.2	105,301	20.6	400,332	78.2	511,930	100.0	
976 Ylitornio	141,322	73.4	33,055	17.2	18,170	9.4	192,547	100.0	
<b>Total</b>									
Multi-source inventory	5,015,871	55.4	1,799,074	19.9	2,245,351	24.8	9,060,296	100.0	
Field inventory	5,006,444	55.2	1,722,313	19.0	2,345,304	25.8	9,074,061	100.0	
SE of field inventory	60,791		54,198		56,287		18,931		



243	Kimito-Kemiö	15,388	88.5	2,002	11.5	2,335	90.7	239	9.3	684	74.8	230	25.2	18,408	88.2	2,471	11.8
257	Kirkkonummi-Kyrkslätt	16,545	88.4	2,169	11.6	3,469	97.9	76	2.1	333	53.0	296	47.0	20,348	88.9	2,541	11.1
279	Korpo-Korppoo	8,013	95.4	387	4.6	3,501	99.0	34	1.0	2,048	96.9	66	3.1	13,562	96.5	486	3.5
407	Lapinjärvi-Lappträsk	15,157	87.9	2,083	12.1	709	92.1	61	7.9	52	47.9	57	52.1	15,918	87.9	2,201	12.1
424	Liljendal	5,056	87.8	702	12.2	261	98.3	4	1.7	0	0.0	11	100.0	5,318	88.1	717	11.9
434	Lovisa-Lovisa	2,390	87.0	357	13.0	146	98.2	3	1.8	11	50.1	11	49.9	2,547	87.3	370	12.7
533	Nagu-Nauvo	12,280	94.4	726	5.6	4,787	96.3	183	3.7	1,372	94.1	86	5.9	18,438	94.9	995	5.1
573	Pargas-Parainen	13,489	92.7	1,064	7.3	2,587	94.1	162	5.9	655	85.4	112	14.6	16,731	92.6	1,338	7.4
585	Pemä-Pernaja	22,431	86.9	3,392	13.1	1,282	97.2	36	2.8	55	16.7	275	83.3	23,769	86.5	3,704	13.5
606	Pohja-Pojo	12,767	85.7	2,131	14.3	1,424	90.9	143	9.1	193	50.3	191	49.7	14,384	85.4	2,465	14.6
638	Porvoo-Borgå	32,411	89.0	4,019	11.0	2,111	96.5	77	3.5	87	14.7	505	85.3	34,609	88.3	4,601	11.7
701	Ruotsinpyhää-Strömfors	13,305	82.9	2,753	17.1	724	99.4	4	0.6	102	30.0	239	70.0	14,132	82.5	2,996	17.5
753	Sipoo-Sibbo	17,330	88.5	2,261	11.5	810	90.9	81	9.1	112	25.7	323	74.3	18,252	87.3	2,665	12.7
755	Siuntio-Sjundeå	11,160	89.9	1,252	10.1	965	97.9	20	2.1	62	39.4	96	60.6	12,187	89.9	1,368	10.1
835	Ekenäs-Tammisaari	38,379	87.7	5,388	12.3	7,955	94.4	468	5.6	1,037	55.7	825	44.3	47,371	87.6	6,681	12.4
923	Västernärjärd	5,167	90.6	535	9.4	1,098	91.3	105	8.7	309	83.7	60	16.3	6,573	90.4	699	9.6
Total		324,477	88.7	41,186	11.3	49,621	95.8	2,170	4.2	11,070	70.7	4,596	29.3	385,167	88.9	47,952	11.1

**Rannikko/Pohjanmaa***Municipality*

231	Kaskinen-Kaskö	589	91.1	57	8.9	36	81.4	8	18.6	34	69.2	15	30.8	659	89.1	80	10.9
272	Kokkola-Karleby	14,374	68.8	6,509	31.2	380	31.6	823	68.4	300	44.3	377	55.7	15,053	66.1	7,710	33.9
280	Korsnäs	13,904	79.8	3,518	20.2	112	26.4	313	73.6	147	15.7	789	84.3	14,163	75.4	4,620	24.6
287	Kristinestad-	36,114	76	11,394	24	560	36.6	969	63.4	155	15.4	854	84.6	36,829	73.6	13,217	26.4
	Kristinestad-kaupunki																
288	Kronoby-Kruunupy	29,158	59.7	19,653	40.3	642	17.4	3,052	82.6	236	10.9	1,918	89.1	30,035	54.9	24,624	45.1
440	Larsmo-Luoto	6,990	71.8	2,739	28.2	341	43.2	448	56.8	309	52.4	281	47.6	7,640	68.8	3,468	31.2
475	Malax-Maalhti	25,466	72.1	9,842	27.9	293	19.3	1,228	80.7	219	9.4	2,099	90.6	25,978	66.4	13,170	33.6
499	Korsholm-Mustasaari	45,686	84.7	8,264	15.3	749	25.1	2,232	74.9	808	31.3	1,770	68.7	47,244	79.4	12,266	20.6
545	Närpes-Närpiö	44,442	69.2	19,795	30.8	714	23.8	2,284	76.2	22	0.8	2,765	99.2	45,178	64.5	24,844	35.5
559	Oravais-Oravainen	8,956	70.8	3,701	29.2	500	45.5	599	54.5	0	0	696	100	9,456	65.4	4,996	34.6
598	Jakobstad-Pietarsaari	3,918	70.5	1,636	29.5	143	39.2	222	60.8	65	35.6	118	64.4	4,127	67.6	1,976	32.4
599	Pedersöre-Pedersören	33,127	61.1	21,107	38.9	854	21.1	3,200	78.9	19	1.7	1,048	98.3	33,999	57.3	25,354	42.7
	kunta																

(continued)





406	Lappi	10,975	82.0	2,403	18.0	512	77.0	153	23.0	67	23.7	217	76.3	11,554	80.6	2,773	19.4
413	Lavia	17,395	75.5	5,640	24.5	85	10.7	710	89.3	96	14.3	575	85.7	17,576	71.7	6,924	28.3
419	Lemu	1,674	93.2	122	6.8	145	95.5	7	4.5	34	49.7	35	50.3	1,853	91.9	164	8.1
423	Lieto	7,642	86.4	1,207	13.6	451	82.7	95	17.3	34	32.5	71	67.5	8,128	85.6	1,373	14.4
430	Loimaa	13,184	74.0	4,626	26.0	240	37.4	402	62.6	43	5.9	691	94.1	13,467	70.2	5,719	29.8
440	Luvia	10,361	87.2	1,523	12.8	75	54.9	62	45.1	44	30.4	100	69.6	10,480	86.2	1,684	13.8
480	Marttila	7,084	77.8	2,016	22.2	156	42.6	210	57.4	15	2.7	530	97.3	7,254	72.5	2,756	27.5
481	Masku	3,748	87.9	516	12.1	380	90.5	40	9.5	60	27.1	160	72.9	4,187	85.4	716	14.6
482	Mellilä	2,576	72.2	991	27.8	40	16.2	207	83.8	9	4.7	190	95.3	2,625	65.4	1,388	34.6
484	Merikarvia	23,569	72.6	8,876	27.4	209	26.8	570	73.2	108	4.3	2,391	95.7	23,887	66.9	11,837	33.1
485	Merimasku	2,507	94.3	150	5.7	410	97.2	12	2.8	16	38.1	26	61.9	2,933	94.0	188	6.0
501	Muurila	3,463	83.3	694	16.7	177	80.3	43	19.7	10	13.9	64	86.1	3,650	82.0	801	18.0
503	Myrämäki	23,863	76.4	7,378	23.6	988	51.0	950	49.0	95	5.6	1,609	94.4	24,946	71.5	9,937	28.5
529	Naantali	2,274	95.9	97	4.1	360	95.6	17	4.4	25	63.2	15	36.8	2,659	95.4	128	4.6
531	Nakkila	6,833	78.3	1,897	21.7	63	39.2	97	60.8	23	13.8	144	86.2	6,918	76.4	2,138	23.6
537	Noormarkku	18,383	75.3	6,039	24.7	169	20.2	668	79.8	113	13.6	718	86.4	18,665	71.5	7,424	28.5
538	Nousiainen	8,790	81.5	1,992	18.5	537	72.7	202	27.3	23	4.6	464	95.4	9,350	77.9	2,658	22.1
561	Oripää	4,017	72.3	1,540	27.7	126	58.3	90	41.7	16	4.9	309	95.1	4,159	68.2	1,939	31.8
577	Paimio	9,976	89.5	1,168	10.5	1,073	91.5	100	8.5	78	45.2	94	54.8	11,127	89.1	1,362	10.9
586	Pemö	19,188	83.0	3,929	17.0	1,118	72.9	416	27.1	60	12.3	428	87.7	20,366	81.0	4,772	19.0
587	Pertteli	5,609	84.6	1,017	15.4	252	84.4	47	15.6	18	22.8	61	77.2	5,879	83.9	1,124	16.1
602	Piikkiö	3,564	93.4	250	6.6	404	93.2	29	6.8	39	62.6	23	37.4	4,006	93.0	302	7.0
608	Pomarkku	16,798	74.0	5,909	26.0	158	19.1	668	80.9	65	5.1	1,218	94.9	17,021	68.6	7,794	31.4
609	Pori	23,677	83.9	4,542	16.1	267	51.8	248	48.2	241	33.9	468	66.1	24,185	82.1	5,259	17.9
631	Pyhäranta	8,410	87.8	1,172	12.2	345	83.6	68	16.4	60	36.7	104	63.3	8,815	86.8	1,343	13.2
636	Pöytyä	16,184	78.8	4,341	21.2	350	37.7	580	62.3	28	2.6	1,053	97.4	16,562	73.5	5,974	26.5
680	Raisio	1,716	92.7	135	7.3	209	92.3	18	7.7	35	71.2	14	28.8	1,960	92.2	167	7.8
684	Rauma	15,766	88.1	2,138	11.9	940	89.9	106	10.1	149	43.6	193	56.4	16,855	87.4	2,437	12.6
704	Rusko	1,969	87.1	292	12.9	147	90.9	15	9.1	22	48.2	23	51.8	2,138	86.6	330	13.4
705	Rymättylä	6,878	96.0	285	4.0	2,180	97.3	61	2.7	62	54.4	52	45.6	9,121	95.8	398	4.2
734	Salo	6,323	85.4	1,080	14.6	268	84.5	49	15.5	48	59.8	32	40.2	6,638	85.1	1,162	14.9
738	Sauvo	10,953	91.7	993	8.3	1,287	94.5	75	5.5	159	60.0	106	40.0	12,399	91.4	1,174	8.6
747	Siikainen	23,029	67.9	10,899	32.1	233	19.4	966	80.6	124	3.9	3,035	96.1	23,386	61.1	14,900	38.9
761	Somero	26,056	78.5	7,118	21.5	456	51.4	431	48.6	86	13.1	573	86.9	26,598	76.6	8,122	23.4
776	Suomusjärvi	9,236	84.5	1,691	15.5	426	76.3	132	23.7	68	32.1	144	67.9	9,730	83.2	1,967	16.8
783	Säkylä	7,305	75.7	2,341	24.3	388	63.8	220	36.2	20	11.0	158	89.0	7,713	73.9	2,720	26.1

(continued)

Table 2a (continued)

	Forest land						Poorly productive forest land						Unproductive land						Total					
	Mineral soil			Peatland			Mineral soil			Peatland			Mineral soil			Peatland			Mineral soil			Peatland		
	(ha)	(%)	(%)	(ha)	(%)	(%)	(ha)	(%)	(%)	(ha)	(%)	(%)	(ha)	(%)	(%)	(ha)	(%)	(%)	(ha)	(%)	(%)	(ha)	(%)	(%)
784	Särkisalo-Finby	4,805	90.4	509	9.6	376	92.5	31	7.5	59	68.3	27	31.7	5,239	90.2	567	9.8							
833	Taivassalo	5,934	95.4	283	4.6	1,273	97.2	37	2.8	63	53.2	55	46.8	7,270	95.1	375	4.9							
838	Tarvasjoki	3,756	86.2	601	13.8	97	75.1	32	24.9	13	31.2	28	68.8	3,866	85.4	662	14.6							
853	Turku-Äbo	7,948	90.3	854	9.7	1,046	92.8	82	7.2	142	49.9	143	50.1	9,136	89.4	1,079	10.6							
886	Ulvila	20,119	73.5	7,244	26.5	167	15.6	904	84.4	97	11.2	773	88.8	20,384	69.6	8,921	30.4							
895	Uusikaupunki	25,758	90.7	2,653	9.3	2,740	93.2	199	6.8	531	54.2	449	45.8	29,028	89.8	3,301	10.2							
906	Vahto	3,310	79.3	866	20.7	118	53.7	102	46.3	9	3.0	289	97.0	3,437	73.2	1,257	26.8							
913	Vampula	5,063	75.2	1,670	24.8	35	40.2	52	59.8	20	24.8	60	75.2	5,118	74.2	1,782	25.8							
918	Vehmaa	8,319	90.8	848	9.2	748	91.4	70	8.6	119	50.4	117	49.6	9,186	89.9	1,035	10.1							
920	Velkua	1,634	97.0	50	3.0	600	99.2	5	0.8	13	60.9	8	39.1	2,247	97.3	63	2.7							
979	Yläne	17,175	72.3	6,587	27.7	615	36.3	1,078	63.7	23	1.7	1,341	98.3	17,813	66.4	9,006	33.6							
Total		758,227	77.7	217,651	22.3	32,109	58.6	22,711	41.4	4,392	10.9	36,018	89.1	794,728	74.2	276,380	25.8							
<b>Häme-Uusimaa</b>																								
<i>Municipality</i>																								
15	Arjärke	8,899	94.1	555	5.9	323	95.4	16	4.6	17	29.2	41	70.8	9,238	93.8	612	6.2							
16	Asikkala	37,907	88.2	5,093	11.8	295	48.4	315	51.6	53	19.5	218	80.5	38,255	87.2	5,626	12.8							
18	Askola	10,824	89.0	1,336	11.0	163	84.5	30	15.5	0	0.0	76	100.0	10,987	88.4	1,442	11.6							
61	Forssa	10,450	76.0	3,301	24.0	3	1.6	184	98.4	2	0.8	318	99.3	10,456	73.3	3,803	26.7							
81	Hartola	38,156	86.8	5,786	13.2	20	5.6	340	94.4	76	12.4	537	87.6	38,253	85.2	6,663	14.8							
82	Hattula	18,172	71.8	7,149	28.2	16	3.5	442	96.5	0	0.0	693	100.0	18,188	68.7	8,284	31.3							
83	Hauho	20,564	83.7	4,013	16.3	45	18.8	194	81.2	2	0.9	271	99.1	20,611	82.2	4,477	17.9							
86	Hausjärvi	17,035	84.9	3,031	15.1	103	29.4	248	70.7	8	3.7	205	96.3	17,146	83.1	3,484	16.9							
98	Hollola	27,242	91.7	2,472	8.3	102	37.3	171	62.7	150	41.3	213	58.7	27,494	90.6	2,856	9.4							
103	Humppila	5,542	77.1	1,643	22.9	45	29.9	105	70.1	1	0.9	131	99.1	5,588	74.8	1,879	25.2							
106	Hyvinkää	15,238	78.4	4,203	21.6	192	44.2	243	55.8	9	3.3	246	96.7	15,439	76.7	4,692	23.3							
109	Hämeenlinna	8,643	80.5	2,089	19.5	23	20.6	89	79.4	1	0.6	95	99.4	8,667	79.2	2,273	20.8							
111	Heinola	50,807	89.4	6,056	10.7	843	64.3	469	35.7	1	0.3	339	99.7	51,651	88.3	6,863	11.7							
165	Janakkala	26,504	78.9	7,090	21.1	91	19.4	378	80.7	6	1.2	496	98.8	26,600	77.0	7,964	23.0							
169	Jokioinen	6,822	85.0	1,200	15.0	9	18.0	43	82.0	0	0.3	157	99.7	6,832	83.0	1,400	17.0							
186	Järvenpää	1,386	92.6	111	7.4	20	81.3	5	18.7	0	0.0	14	100.0	1,406	91.6	129	8.4							

210	Kalvola	16,421	73.6	5,897	26.4	1	0.4	193	99.6	8	3.2	246	96.8	16,430	72.2	6,337	27.8
223	Karjalohja	6,513	85.6	1,099	14.4	163	76.5	50	23.5	1	1.1	121	98.9	6,677	84.0	1,270	16.0
224	Karkkila	13,055	80.6	3,150	19.4	70	55.9	55	44.2	3	2.7	105	97.3	13,128	79.9	3,311	20.1
245	Kerava	1,311	89.9	148	10.1	15	87.3	2	12.7	0	3.5	7	96.5	1,326	89.4	158	10.6
283	Hämeenkoski	10,595	88.8	1,332	11.2	12	18.8	52	81.2	47	52.7	42	47.3	10,654	88.2	1,426	11.8
316	Kärkölä	11,738	86.3	1,869	13.7	10	4.4	226	95.6	22	10.2	191	89.8	11,770	83.7	2,286	16.3
398	Lahti	7,368	93.0	554	7.0	88	67.6	42	32.4	74	61.9	46	38.1	7,530	92.2	642	7.9
401	Lammı	32,452	82.7	6,792	17.3	33	9.9	301	90.1	35	9.5	328	90.5	32,520	81.4	7,421	18.6
433	Loppi	30,521	73.4	11,038	26.6	85	19.0	363	81.0	12	3.2	356	96.8	30,617	72.3	11,757	27.8
444	Lojia-Lojo	15,094	93.3	1,089	6.7	101	93.1	7	6.9	3	3.8	87	96.2	15,198	92.8	1,183	7.2
504	Myrskylä-Mörskom	11,116	89.9	1,250	10.1	266	87.5	38	12.5	8	7.1	108	92.9	11,391	89.1	1,396	10.9
505	Mäntsälä	28,325	85.0	5,007	15.0	231	37.7	381	62.3	20	4.7	415	95.3	28,576	83.1	5,804	16.9
532	Nastola	20,523	90.5	2,150	9.5	643	75.2	212	24.8	46	25.9	131	74.1	21,212	89.5	2,493	10.5
540	Nuummi-Pusula	24,872	84.2	4,686	15.9	157	59.5	107	40.5	4	1.9	209	98.1	25,033	83.4	5,002	16.7
543	Nurmijärvi	15,756	88.3	2,080	11.7	287	85.0	51	15.0	4	4.1	102	95.9	16,047	87.8	2,233	12.2
560	Orimattila	32,480	93.3	2,322	6.7	610	78.6	166	21.4	241	54.8	198	45.2	33,331	92.5	2,687	7.5
576	Padasjoki	36,834	82.9	7,585	17.1	34	12.7	230	87.3	21	8.3	228	91.7	36,888	82.1	8,043	17.9
611	Pomainen	7,294	85.6	1,229	14.4	106	73.4	39	26.6	1	0.7	81	99.3	7,401	84.6	1,348	15.4
616	Pukkila	6,713	90.0	749	10.0	78	73.9	28	26.1	20	27.0	55	73.0	6,812	89.1	832	10.9
692	Renko	13,556	71.8	5,323	28.2	25	7.5	314	92.5	4	1.2	348	98.8	13,586	69.4	5,984	30.6
694	Riihimäki	5,593	83.2	1,126	16.8	50	46.6	58	53.4	1	2.1	49	97.9	5,645	82.1	1,233	17.9
737	Sammatti	3,956	88.4	519	11.6	79	72.7	30	27.3	0	0.2	45	99.8	4,036	87.2	593	12.8
781	Sysmä	47,012	90.0	5,223	10.0	99	34.5	189	65.5	65	18.1	296	82.0	47,176	89.2	5,708	10.8
834	Tammela	29,709	67.9	14,068	32.1	0	0.0	846	100.0	17	0.6	2,672	99.4	29,726	62.8	17,586	37.2
855	Tuulos	9,795	81.6	2,203	18.4	38	25.2	113	74.8	2	2.1	107	97.9	9,836	80.2	2,423	19.8
858	Tuusula	9,279	87.9	1,275	12.1	158	80.2	39	19.8	0	0.0	69	100.0	9,437	87.2	1,383	12.8
927	Vihı	28,413	88.8	3,596	11.2	231	68.8	105	31.2	7	4.9	140	95.1	28,651	88.2	3,841	11.8
981	Ypäjä	6,497	82.0	1,428	18.0	28	26.8	77	73.2	0	0.3	131	99.7	6,526	80.0	1,636	20.0
Total		786,985	84.0	149,914	16.0	5,992	44.1	7,583	55.9	994	8.3	10,965	91.7	793,972	82.5	168,462	17.5
<b>Kaakkoi-Suomi</b>																	
<i>Municipality</i>																	
44	Elimäki	16,912	87.0	2,528	13.0	220	69.2	98	30.8	0	0.0	82	100.0	17,131	86.3	2,709	13.7
75	Hamina	35,704	81.6	8,066	18.4	760	68.7	347	31.3	128	17.8	592	82.2	36,591	80.3	9,004	19.7
142	Iiti	33,958	86.1	5,504	13.9	572	70.7	238	29.3	0	0.0	274	100.0	34,530	85.2	6,016	14.8
153	Imatra	8,106	84.8	1,458	15.2	37	64.3	21	35.7	3	6.5	39	93.5	8,146	84.3	1,518	15.7

(continued)

Table 2a (continued)

	Forest land						Poorly productive forest land						Unproductive land						Total					
	Mineral soil		Peatland		(%)		Mineral soil		Peatland		(%)		Mineral soil		Peatland		(%)		Mineral soil		Peatland		(%)	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(%)	
163	29,545	85.0	5,232	15.0	538	81.4	123	18.6	30	9.1	300	90.9	30,112	84.2	5,655	15.8								
173	16,410	81.5	3,737	18.5	3	2.1	119	97.9	0	0.0	89	100.0	16,413	80.6	3,945	19.4								
285	14,898	83.1	3,032	16.9	483	70.5	202	29.5	151	38.2	245	61.8	15,532	81.7	3,480	18.3								
286	1,813	85.5	308	14.5	19	63.8	11	36.2	5	19.7	19	80.3	1,836	84.5	338	15.5								
306	5,645	82.4	1,202	17.6	61	66.0	31	34.0	0	0.0	58	100.0	5,706	81.5	1,292	18.5								
405	42,299	78.8	11,408	21.2	14	4.3	317	95.7	0	0.0	468	100.0	42,314	77.6	12,193	22.4								
416	12,957	81.9	2,867	18.1	55	46.4	64	53.6	9	8.5	100	91.5	13,021	81.1	3,031	18.9								
441	42,741	72.7	16,023	27.3	315	31.2	695	68.8	24	2.6	888	97.4	43,080	71.0	17,606	29.0								
489	25,521	80.3	6,265	19.7	173	36.0	308	64.0	12	2.8	401	97.2	25,706	78.7	6,975	21.3								
580	35,232	83.8	6,801	16.2	66	27.6	174	72.4	12	4.7	245	95.3	35,310	83.0	7,219	17.0								
624	16,812	82.7	3,518	17.3	490	45.7	582	54.3	125	21.3	460	78.7	17,427	79.3	4,559	20.7								
689	23,067	82.4	4,936	17.6	45	31.2	98	68.8	6	7.2	82	92.8	23,118	81.9	5,117	18.1								
700	62,775	79.7	16,010	20.3	530	52.1	487	47.9	40	9.6	376	90.4	63,345	79.0	16,873	21.0								
739	33,893	81.0	7,926	19.0	462	61.8	286	38.2	116	25.3	342	74.7	34,471	80.1	8,554	19.9								
754	37,366	77.7	10,694	22.3	537	43.2	705	56.8	32	2.6	1,197	97.4	37,935	75.1	12,597	24.9								
831	21,088	86.9	3,166	13.1	325	67.0	160	33.0	59	27.2	157	72.8	21,471	86.0	3,483	14.0								
909	50,601	79.7	12,917	20.3	820	60.7	532	39.3	110	11.5	850	88.5	51,530	78.3	14,299	21.7								
935	22,320	84.5	4,090	15.5	358	55.9	282	44.1	180	31.1	399	68.9	22,858	82.7	4,772	17.3								
978	24,303	79.8	6,139	20.2	112	24.3	349	75.7	29	5.3	521	94.7	24,443	77.7	7,009	22.3								
Total	637,007	81.1	148,405	18.9	7,132	52.8	6,363	47.2	1,097	11.7	8,293	88.3	645,236	79.8	163,061	20.2								
<b>Pirkanmaa</b>																								
<i>Municipality</i>																								
20	4,637	84.3	861	15.7	13	26.0	37	74.0	7	7.2	84	92.8	4,657	82.6	983	17.4								
108	25,287	79.6	6,488	20.4	62	12.6	431	87.4	33	15.1	187	84.9	25,383	78.1	7,107	21.9								
143	41,722	75.0	13,928	25.0	191	14.2	1,150	85.8	72	8.7	752	91.3	41,985	72.6	15,829	27.4								
177	16,130	80.2	3,989	19.8	61	24.3	192	75.7	30	16.6	152	83.4	16,222	78.9	4,333	21.1								
211	29,906	85.0	5,259	15.0	143	39.9	215	60.1	51	23.1	171	76.9	30,100	84.2	5,646	15.8								
250	15,059	55.9	11,891	44.1	143	13.6	910	86.4	16	1.6	970	98.4	15,218	52.5	13,771	47.5								
289	10,631	82.0	2,340	18.0	61	41.4	86	58.6	13	13.2	87	86.8	10,705	81.0	2,513	19.0								
303	43,212	72.9	16,097	27.1	169	11.1	1,356	88.9	83	5.4	1,454	94.6	43,464	69.7	18,907	30.3								

310	Kylmäkoski	9,313	80,0	2,324	20,0	27	21,7	99	78,3	0	0,0	89	100,0	9,340	78,8	2,511	21,2
418	Lempäälä	16,195	85,7	2,706	14,3	26	24,9	78	75,1	17	14,9	98	85,1	16,238	84,9	2,883	15,1
493	Mouhijärvi	14,897	83,8	2,889	16,2	51	22,4	178	77,6	22	20,2	85	79,8	14,970	82,6	3,152	17,4
506	Mänttä	3,621	78,4	997	21,6	13	34,4	25	65,6	6	14,5	33	85,5	3,639	77,5	1,055	22,5
536	Nokia	18,027	87,0	2,698	13,0	43	26,3	121	73,7	24	28,6	59	71,4	18,094	86,3	2,879	13,7
562	Orivesi	52,531	84,5	9,648	15,5	163	25,2	484	74,8	99	21,7	360	78,3	52,793	83,4	10,492	16,6
581	Parkano	37,896	60,0	25,281	40,0	221	5,8	3,609	94,2	80	2,4	3,195	97,6	38,197	54,3	32,084	45,7
604	Pirkkala	4,802	87,9	664	12,1	7	24,1	22	75,9	5	16,9	24	83,1	4,813	87,2	710	12,8
619	Punkalundun	14,132	74,7	4,781	25,3	194	30,8	437	69,2	29	4,6	600	95,4	14,355	71,2	5,819	28,8
635	Pälkäne	35,798	85,3	6,161	14,7	215	54,8	177	45,2	33	14,5	193	85,5	36,045	84,7	6,531	15,3
702	Ruovesi	51,486	83,0	10,516	17,0	221	24,2	695	75,8	110	11,2	876	88,8	51,818	81,1	12,086	18,9
837	Tampere	31,491	84,7	5,697	15,3	81	25,8	232	74,2	63	25,2	186	74,8	31,635	83,8	6,115	16,2
887	Urjala	24,047	77,3	7,053	22,7	106	18,0	482	82,0	14	2,5	525	97,5	24,167	75,0	8,060	25,0
908	Valkeakoski	14,870	85,1	2,598	14,9	172	33,4	104	66,6	24	15,6	132	84,4	14,947	84,1	2,834	15,9
912	Vammala	45,890	81,6	10,378	18,4	175	21,5	639	78,5	61	11,8	459	88,2	46,126	80,1	11,476	19,9
922	Vesilahti	18,210	85,0	3,225	15,0	51	27,8	133	72,2	25	20,3	98	79,7	18,287	84,1	3,456	15,9
933	Vilppula	30,578	80,4	7,459	19,6	135	34,6	255	65,4	65	19,4	268	80,6	30,777	79,4	7,982	20,6
936	Virrat	64,346	70,5	26,901	29,5	414	15,9	2,199	84,1	88	2,7	3,174	97,3	64,848	66,8	32,274	33,2
980	Ylöjärvi	23,887	82,1	5,205	17,9	60	19,4	248	80,6	38	15,5	204	84,5	23,984	80,9	5,657	19,1
988	Äetsä	13,374	82,8	2,775	17,2	67	31,2	147	68,8	20	23,0	68	77,0	13,461	81,8	2,991	18,2
Total		711,977	78,0	200,810	22,0	3,165	17,7	14,741	82,3	1,128	7,2	14,585	92,8	716,269	75,7	230,136	24,3
<b>Etelä-Savo</b>																	
<i>Municipality</i>																	
46	Enonkoski	23,743	83,1	4,813	16,9	92	61,7	57	38,3	3	2,6	99	97,4	23,837	82,8	4,969	17,2
90	Heinävesi	80,143	84,5	14,708	15,5	0	0,0	582	100,0	3	0,9	324	99,1	80,146	83,7	15,613	16,3
97	Hirvensalmi	34,123	85,0	5,998	15,0	151	23,1	505	76,9	22	5,4	382	94,6	34,296	83,3	6,885	16,7
171	Joroinen	33,115	72,0	12,856	28,0	24	2,9	801	97,1	34	10,4	295	89,6	33,174	70,4	13,953	29,6
178	Juva	73,568	74,5	25,183	25,5	299	15,1	1,683	84,9	17	2,4	710	97,6	73,885	72,8	27,576	27,2
213	Kangasniemi	68,904	75,4	22,434	24,6	127	8,1	1,441	91,9	61	9,0	620	91,0	69,092	73,8	24,495	26,2
246	Kerimäki	38,032	76,8	11,462	23,2	225	31,3	495	68,7	16	3,3	479	96,7	38,274	75,5	12,437	24,5
491	Mikkeli	111,691	78,8	30,078	21,2	353	11,2	2,789	88,8	72	4,0	1,725	96,0	112,116	76,4	34,591	23,6
507	Mäntyharju	68,897	81,4	15,736	18,6	623	44,1	791	55,9	30	5,5	523	94,5	69,551	80,3	17,050	19,7
588	Pertunmaa	27,418	85,8	4,536	14,2	33	8,9	332	91,1	8	2,4	315	97,6	27,458	84,1	5,184	15,9
593	Pieksämäki	91,041	68,0	42,840	32,0	139	4,2	3,193	95,8	61	3,2	1,823	96,8	91,240	65,6	47,856	34,4
618	Punkaharju	35,061	81,4	8,004	18,6	125	38,2	202	61,8	27	9,7	255	90,3	35,213	80,6	8,461	19,4

(continued)



403	Lappajärvi	14,214	49,4	14,556	50,6	175	8,1	1,991	91,9	0	0	1,510	100	14,389	44,3	18,057	55,7	
408	Lapua	25,419	59,5	17,337	40,5	319	9,5	3,027	90,5	0	0	1,891	100	25,739	53,6	22,254	46,4	
414	Lehtimäki	9,814	54,3	8,256	45,7	241	10,1	2,152	89,9	0	0	1,332	100	10,055	46,1	11,740	53,9	
421	Lestijärvi	18,777	56,6	14,426	43,4	251	5,5	4,320	94,5	48	0,9	5,547	99,1	19,076	44	24,293	56	
429	Lohtaja	16,836	58,2	12,068	41,8	463	15,5	2,534	84,5	205	15,5	1,115	84,5	17,504	52,7	15,717	47,3	
544	Nurmo	13,133	56,6	10,054	43,4	106	6,1	1,650	93,9	0	0	1,371	100	13,239	50,3	13,074	49,7	
584	Petho	30,027	56,7	22,970	43,3	223	4,9	4,328	95,1	217	2,4	8,629	97,6	30,467	45,9	35,927	54,1	
743	Seinäjoki	18,843	54,3	15,852	45,7	321	14,4	1,898	85,6	0	0	1,832	100	19,163	49,5	19,582	50,5	
759	Soini	23,409	57,7	17,161	42,3	408	11,4	3,168	88,6	0	0	2,550	100	22,817	51	22,878	49	
846	Teuva	22,642	63,1	13,236	36,9	159	5,7	2,609	94,3	51	2,6	1,880	97,4	22,851	56,3	17,726	43,7	
849	Toholampi	21,408	59,3	14,722	40,7	140	3,3	4,114	96,7	54	1,1	4,786	98,9	21,602	47,8	23,622	52,2	
863	Töysä	13,808	64,8	7,506	35,2	302	28,4	760	71,6	0	0	408	100	14,110	61,9	8,675	38,1	
885	Ullava	6,070	56,5	4,669	43,5	59	5,1	1,102	94,9	20	2,1	943	97,9	6,150	47,8	6,714	52,2	
924	Veteli	15,417	47	17,374	53	170	4,1	3,981	95,9	0	0	3,761	100	15,588	38,3	25,115	61,7	
934	Vimpeli	9,620	51	9,250	49	212	11,5	1,625	88,5	0	0	1,367	100	9,832	44,5	12,243	55,5	
942	Vähäkylä	7,035	79,1	1,863	20,9	149	76,8	45	23,2	14	8,6	146	91,4	7,198	77,8	2,054	22,2	
971	Ylihärmä	4,019	58,9	2,803	41,1	416	41,4	588	58,6	74	19,2	310	80,8	4,509	54,9	3,702	45,1	
975	Ylistaro	18,777	67,5	9,028	32,5	326	18,4	1,446	81,6	34	5	646	95	19,137	63,2	11,119	36,8	
989	Ähtäri	40,286	63	23,709	37	638	20,4	2,496	79,6	0	0	1,667	100	40,924	59,5	27,872	40,5	
Total		740,119	58,1	534,127	41,9	13,310	12,3	94,671	87,7	1,863	2,2	82,041	97,8	755,292	51,5	710,839	48,5	
<b>Keski-Suomi</b>																		
<i>Municipality</i>																		
77	Hankasalmi	37,878	82,1	8,255	17,9	0	0,0	172	100,0	0	0,0	54	100,0	37,878	81,7	8,481	18,3	
172	Joutsa	34,617	85,1	6,067	14,9	69	24,2	218	75,8	0	0,0	29	100,0	34,686	84,6	6,314	15,4	
179	Jyväskylä	6,289	89,1	772	10,9	27	72,6	10	27,4	0	0,0	6	100,0	6,316	88,9	788	11,1	
180	Jyväskylän mlk	30,430	85,7	5,080	14,3	69	29,3	167	70,7	0	0,0	38	100,0	30,499	85,2	5,285	14,8	
182	Jämsä	80,194	83,7	15,640	16,3	383	41,9	532	58,1	64	12,6	442	87,4	80,641	82,9	16,614	17,1	
183	Jämsänkoski	28,119	82,6	5,918	17,4	102	22,7	349	77,3	3	2,2	112	97,8	28,224	81,6	6,380	18,4	
216	Kannonkoski	30,313	77,6	8,743	22,4	208	35,3	382	64,7	1	6,5	15	93,5	30,522	77,0	9,140	23,0	
226	Karstula	46,080	65,1	24,724	34,9	299	9,1	3,002	90,9	2	0,1	1,522	99,9	46,382	61,3	29,248	38,7	
249	Keuruu	81,476	75,8	25,971	24,2	350	14,5	2,063	85,5	0	0,0	775	100,0	81,827	74,0	28,809	26,0	
256	Kinnula	24,135	63,8	13,708	36,2	301	12,1	2,193	87,9	2	0,3	754	99,7	24,439	59,5	16,655	40,5	
265	Kivijärvi	29,831	72,3	11,434	27,7	278	16,0	1,456	84,0	5	0,7	714	99,3	30,114	68,9	13,604	31,1	
275	Konnevesi	36,777	84,2	6,880	15,8	35	14,2	209	85,8	0	0,0	97	100,0	36,811	83,7	7,187	16,3	
277	Korpilahti	45,442	87,6	6,436	12,4	193	58,1	139	41,9	0	0,0	46	100,0	45,635	87,3	6,621	12,7	

(continued)

Table 2a (continued)

	Forest land						Poorly productive forest land						Unproductive land						Total					
	Mineral soil		Peatland		(%)		Mineral soil		Peatland		(%)		Mineral soil		Peatland		(%)		Mineral soil		Peatland		(%)	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(%)	
291	49,121	86.3	7,782	13.7	393	59.0	274	41.0	0	0.0	12	100.0	49,514	86.0	8,067	14.0								
312	18,404	57.5	13,612	42.5	278	7.5	3,435	92.5	0	0.0	1,687	100.0	18,682	49.9	18,734	50.1								
410	41,987	85.2	7,321	14.8	131	44.4	165	55.6	0	0.0	34	100.0	42,119	84.9	7,520	15.1								
415	22,613	71.5	9,014	28.5	39	5.0	739	95.0	0	0.0	204	100.0	22,652	69.5	9,958	30.5								
435	15,764	87.6	2,225	12.4	70	62.0	43	38.0	0	0.0	18	100.0	15,834	87.4	2,286	12.6								
495	44,005	69.2	19,562	30.8	179	9.1	1,784	90.9	1	0.1	721	99.9	44,184	66.7	22,067	33.3								
500	10,384	89.4	1,230	10.6	37	61.3	23	38.7	0	0.0	9	100.0	10,421	89.2	1,262	10.8								
592	31,238	79.8	7,884	20.4	18	4.3	396	95.7	0	0.0	121	100.0	31,256	78.8	8,401	21.2								
601	60,668	68.6	27,720	31.4	527	15.5	2,877	84.5	7	0.7	983	99.3	61,202	66.0	31,580	34.0								
633	20,280	67.7	9,656	32.3	87	7.8	1,028	92.2	0	0.1	449	99.9	20,367	64.7	11,133	35.3								
729	58,049	78.8	15,580	21.2	106	12.7	730	87.3	3	1.0	275	99.0	58,158	77.8	16,584	22.2								
850	25,505	84.0	4,860	16.0	61	32.9	125	67.1	0	0.0	24	100.0	25,566	83.6	5,009	16.4								
892	22,837	77.3	6,704	22.7	61	14.8	351	85.2	0	0.1	123	99.9	22,897	76.1	7,179	23.9								
931	85,019	79.6	21,782	20.4	390	29.6	929	70.4	1	0.5	283	99.5	85,410	78.8	22,993	21.2								
992	59,621	81.7	13,396	18.3	230	31.7	496	68.3	0	0.1	147	99.9	59,851	81.0	14,039	19.0								
Total	1,077,074	77.8	307,957	22.2	4,923	16.9	24,286	83.1	88	0.9	9,693	99.1	1,082,085	76.0	341,936	24.0								
<b>Pohjois-Savo</b>																								
<i>Municipality</i>																								
140	42,576	75.6	13,737	24.4	35	7.0	460	93.0	0	0.0	144	100.0	42,611	74.8	14,340	25.2								
174	30,058	82.2	6,495	17.8	26	8.3	294	91.7	0	0.0	234	100.0	30,084	81.1	7,022	18.9								
204	46,220	79.1	12,179	20.9	195	27.5	513	72.5	0	0.0	446	100.0	46,415	77.9	13,139	22.1								
227	31,836	79.2	8,337	20.8	0	0.0	242	100.0	0	0.0	154	100.0	31,836	78.5	8,733	21.5								
239	28,142	70.1	11,987	29.9	24	3.7	625	96.3	1	0.5	265	99.5	28,167	68.6	12,877	31.4								
263	59,569	59.5	40,477	40.5	16	0.7	2,233	99.3	0	0.0	1,337	100.0	59,585	57.5	44,047	42.5								
297	78,422	85.7	13,072	14.3	38	10.9	313	89.1	0	0.1	181	99.9	78,460	85.3	13,566	14.7								
402	33,917	72.4	12,909	27.6	16	3.3	475	96.7	1	0.4	326	99.6	33,935	71.2	13,710	28.8								
420	81,459	85.0	14,413	15.0	0	0.0	293	100.0	0	0.0	384	100.0	81,459	84.4	15,091	15.6								
476	27,237	78.3	7,540	21.7	19	9.9	175	90.1	0	0.2	143	99.8	27,257	77.6	7,859	22.4								
534	44,518	79.3	11,621	20.7	28	4.5	599	95.5	0	0.0	485	100.0	44,547	77.8	12,704	22.2								
595	65,382	69.1	29,227	30.9	113	7.5	1,396	92.5	1	0.1	955	99.9	65,496	67.5	31,578	32.5								
686	37,931	84.4	7,035	15.6	0	0.0	221	100.0	0	0.0	210	100.0	37,931	83.6	7,466	16.4								



687	Rautavaara	57,747	60.6	37,534	39.4	76	1.5	4,943	98.5	0	0.0	4,547	100.0	57,823	55.1	47,024	44.9
749	Siilinjärvi	23,117	82.6	4,866	17.4	11	9.5	102	90.5	1	0.4	137	99.6	23,128	81.9	5,104	18.1
762	Sonkajärvi	73,213	60.3	48,175	39.7	26	0.5	5,141	99.5	0	0.0	3,912	100.0	73,239	56.1	57,228	43.9
778	Suonenjoki	47,273	78.2	13,163	21.8	0	0.0	204	100.0	0	0.0	336	100.0	47,273	77.5	13,702	22.5
844	Tervo	23,879	82.2	5,159	17.8	0	0.0	109	100.0	0	0.0	119	100.0	23,879	81.6	5,387	18.4
857	Tuusniemi	38,987	85.3	6,729	14.7	98	35.2	181	64.8	0	0.0	207	100.0	39,085	84.6	7,116	15.4
915	Varkaus	26,285	82.7	5,483	17.3	0	0.0	139	100.0	9	4.9	171	95.1	26,293	81.9	5,793	18.1
916	Varpaisjärvi	7,377	70.9	11,215	29.1	26	4.4	570	95.6	0	0.0	434	100.0	27,404	69.2	12,219	30.8
921	Vesanto	28,575	81.9	6,323	18.1	0	0.0	159	100.0	0	0.5	86	99.5	28,575	81.3	6,568	18.7
925	Vieremä	47,139	63.9	26,652	36.1	0	0.0	1,896	100.0	0	0.0	1,324	100.0	47,139	61.2	29,871	38.8
	Total	1,000,856	73.9	354,329	26.1	749	3.4	21,283	96.6	14	0.1	16,535	99.9	1,001,620	71.9	392,147	28.1
<b>Pohjois-Karjala</b>																	
<i>Municipality</i>																	
45	Eno	58,828	71.8	23,146	28.2	235	10.5	1,994	89.5	1	0.1	1,787	99.9	59,064	68.7	26,927	31.3
146	Iloantsi	137,738	62.0	84,348	38.0	293	1.9	15,268	98.1	642	3.1	20,112	96.9	138,674	53.7	119,729	46.3
167	Joensuu	72,038	71.7	28,488	28.3	18	1.0	1,818	99.0	14	0.9	1,532	99.1	72,070	69.4	31,838	30.6
176	Juuka	86,222	66.5	43,429	33.5	127	2.9	4,189	97.1	92	3.9	2,265	96.1	86,441	63.4	49,883	36.6
248	Kesälahti	24,058	73.2	8,799	26.8	18	4.8	350	95.2	36	16.1	189	83.9	24,112	72.1	9,338	27.9
260	Kitee	50,393	71.7	19,889	28.3	5	0.8	683	99.2	2	0.3	661	99.7	50,401	70.4	21,233	29.6
276	Kontiolahti	46,850	70.3	19,839	29.7	88	9.3	859	90.7	64	8.5	692	91.5	47,002	68.7	21,389	31.3
309	Oulokumpu	26,273	73.8	9,342	26.2	7	1.7	390	98.3	2	0.3	665	99.7	26,282	71.7	10,397	28.3
422	Lieksa	206,433	70.4	86,668	29.6	434	3.6	11,537	96.4	320	2.7	11,384	97.3	207,187	65.4	109,590	34.6
426	Liperi	47,126	83.9	9,056	16.1	142	41.9	197	58.1	9	4.7	181	95.3	47,277	83.4	9,435	16.6
541	Nurmes	93,744	67.9	44,333	32.1	158	3.1	4,983	96.9	103	4.1	2,390	95.9	94,005	64.5	51,706	35.5
607	Polvijärvi	40,634	63.8	23,024	36.2	2	0.2	1,310	99.8	6	0.4	1,594	99.6	40,642	61.1	25,928	38.9
632	Pyhäselkä	15,532	73.3	5,668	26.7	0	0.0	192	100.0	0	0.0	151	100.0	15,532	72.1	6,010	27.9
707	Rääkkylä	24,211	70.7	10,031	29.3	16	3.0	502	97.0	5	0.8	612	99.2	24,231	68.5	11,145	31.5
848	Tohmajärvi	45,211	66.5	22,762	33.5	0	0.0	1,003	100.0	0	0.0	895	100.0	45,212	64.7	24,661	35.3
911	Valtimo	46,447	68.2	21,617	31.8	46	2.0	2,232	98.0	108	10.3	943	89.7	46,601	65.3	24,792	34.7
	Total	1,021,739	68.9	460,439	31.1	1,589	3.2	47,508	96.8	1,404	3.0	46,053	97.0	1,024,733	64.9	554,000	35.1
<b>Kainuu</b>																	
<i>Municipality</i>																	
105	Hyyrynsalmi	76,999	64.6	42,105	35.4	155	1.6	9,611	98.4	91	1.2	7,258	98.8	77,246	56.7	58,974	43.3
205	Kajaani	80,930	54.7	66,978	45.3	307	2.3	12,889	97.7	124	1.7	7,229	98.3	81,362	48.3	87,096	51.7

(continued)



603	Piippola	14,186	40.4	20,885	59.6	50	1.5	3,381	98.5	1	0.0	2,388	100.0	14,237	34.8	26,654	65.2
615	Pudasjärvi	225,773	61.2	143,151	38.8	2,432	3.7	63,952	96.3	246	0.2	103,025	99.8	228,451	42.4	310,127	57.6
617	Puikkila	10,692	37.0	18,224	63.0	31	1.5	1,978	98.5	0	0.0	1,398	100.0	10,722	33.2	21,600	66.8
625	Pyhäjoki	22,567	54.1	19,161	45.9	488	19.6	1,999	80.4	158	9.3	1,546	90.7	23,214	50.6	22,706	49.4
626	Pyhäsalmi	56,357	54.1	47,871	45.9	380	6.3	5,683	93.7	28	0.6	4,577	99.4	56,765	49.4	58,130	50.6
630	Pyhäntä	24,875	41.7	34,777	58.3	134	1.7	9,113	98.3	5	0.1	7,217	99.9	25,014	33.4	49,906	66.6
678	Raahе	19,739	51.3	18,711	48.7	138	5.8	2,259	94.2	84	4.6	1,743	95.4	19,962	46.8	22,714	53.2
682	Rantsila	16,538	33.0	33,522	67.0	85	1.1	7,779	98.9	5	0.1	5,265	99.9	16,628	26.3	46,566	73.7
691	Reisjärvi	21,172	61.8	13,091	38.2	33	1.1	2,893	98.9	114	9.1	1,143	90.9	21,319	55.5	17,127	44.5
746	Sievi	31,314	58.9	21,844	41.1	332	4.4	7,178	95.6	188	3.6	4,979	96.4	31,834	48.4	34,001	51.6
748	Suikajoki	27,983	41.0	40,228	59.0	267	3.1	8,408	96.9	227	3.2	6,870	96.8	28,476	33.9	55,506	66.1
832	Taivalkoski	146,416	80.3	35,816	19.7	3,245	11.4	25,219	88.6	788	3.1	24,752	96.9	150,449	63.7	85,787	36.3
859	Tyrnävä	9,547	36.5	16,582	63.5	56	1.0	5,284	99.0	0	0.0	3,268	100.0	9,603	27.6	25,134	72.4
889	Uhtajärvi	49,450	46.2	57,506	63.8	293	1.5	19,551	98.5	35	0.1	27,820	99.9	49,779	32.2	104,876	67.8
926	Vihanti	14,191	42.7	19,041	57.3	60	1.5	3,989	98.5	33	1.5	2,220	98.5	14,284	36.1	25,250	63.9
972	Yli-Ii	24,252	47.5	26,821	52.5	189	2.6	7,006	97.4	43	0.4	10,056	99.6	24,483	35.8	43,882	64.2
973	Ylikiminki	32,502	48.5	34,470	51.5	166	1.8	8,940	98.2	23	0.2	15,229	99.8	32,691	35.8	58,639	64.2
977	Ylivieska	23,870	58.9	16,635	41.1	71	2.7	2,575	97.3	40	3.0	1,288	97.0	23,980	53.9	20,498	46.1
Total		1,410,035	57.9	1,026,416	42.1	14,017	4.3	313,845	95.7	4,006	1.1	346,086	98.9	1,428,057	45.9	1,686,347	54.1

**Lapland**

Municipality																	
47	Enontekiö	89,382	94.8	4,951	5.3	149,753	85.6	25,171	14.4	346,119	66.0	178,436	34.0	585,254	73.7	208,558	26.3
148	Inari	693,174	97.3	18,942	2.7	299,115	73.0	110,884	27.1	165,039	44.4	206,926	55.6	1,157,328	77.5	336,753	22.5
240	Kemi	4,966	77.5	1,442	22.5	79	35.7	142	64.3	97	19.3	406	80.7	5,142	72.1	1,990	27.9
241	Keminmaa	25,862	57.3	19,260	42.7	329	7.7	3,961	92.3	159	2.0	7,859	98.0	26,349	45.9	31,080	54.1
261	Kittilä	393,766	84.3	73,229	15.7	23,627	15.9	124,874	84.1	8,449	4.6	175,114	95.4	425,841	53.3	373,217	46.7
273	Kolari	128,443	74.0	45,234	26.0	1,882	4.1	44,284	95.9	684	2.5	26,750	97.5	131,010	53.0	116,268	47.0
320	Kemijärvi	198,482	78.7	53,878	21.4	2,326	4.1	53,970	95.9	1,378	4.6	28,377	95.4	202,186	59.8	136,225	40.3
498	Muonio	112,820	93.1	8,347	6.9	9,201	30.4	21,095	69.6	2,247	8.2	25,264	91.8	124,268	69.4	54,705	30.6
583	Pelkosenniemi	82,513	68.2	38,493	31.8	1,681	4.8	33,410	95.2	1,034	4.4	22,610	95.6	85,228	47.4	94,513	52.6
614	Posto	163,506	78.8	44,067	21.2	3,277	6.7	45,850	93.3	879	2.5	34,820	97.5	167,662	57.3	124,737	42.7
683	Ranua	130,798	65.0	70,336	35.0	1,599	2.3	69,314	97.8	717	1.2	58,193	98.8	133,114	40.2	197,843	59.8
698	Rovaniemi	411,786	73.6	148,006	26.4	4,542	4.2	104,060	95.8	1,638	2.8	57,830	97.3	417,966	57.4	309,896	42.6
732	Salla	303,247	79.4	78,670	20.6	27,456	24.5	84,511	75.5	7,559	11.7	57,345	88.4	338,262	60.5	220,526	39.5
742	Savukoski	382,285	86.9	57,666	13.1	33,417	28.2	85,136	71.8	8,145	11.5	62,896	88.5	423,847	67.3	205,698	32.7

(continued)



**Table 2b** Area and mean volume of growing stock on mineral soils and peatlands on forest land and forest and poorly productive forest land (By forestry centres).

Åland Municipality	Forest land				Forest and poorly productive forest land							
	Mineral soil		Peatland		Mineral soil		Peatland		Total			
	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)				
35 Brändö	2,393	89.7	508	103.5	2,901	92.1	4,943	56.8	595	101.2	5,539	61.6
43 Eckerö	4,751	138.5	764	194.0	5,515	146.2	7,033	104.1	835	182.5	7,868	112.4
60 Finström	5,428	134.6	902	185.5	6,330	141.9	7,066	111.9	970	176.6	8,036	119.7
62 Föglö	5,468	131.2	728	172.3	6,196	136.0	8,177	103.4	817	159.4	8,994	108.5
65 Geta	2,922	131.8	402	194.7	3,323	139.4	5,298	86.8	452	178.7	5,750	94.0
76 Hammarland	5,897	136.6	105	188.5	6,93	144.5	8,112	108.9	1,137	179.3	9,248	117.6
170 Jomala	6,486	140.2	1,064	193.4	7,551	147.7	7,954	121.6	1,126	186.3	9,080	129.6
295 Kumlinge	2,810	110.0	415	153.2	3,225	115.6	5,065	76.4	466	144.6	5,530	82.2
318 Kökar	1,211	90.0	93	132.3	1,304	93.0	1,802	70.8	96	131.0	1,898	73.8
417 Lemland	5,390	136.3	960	186.1	6,350	149	706	114	104	173	800	121.
438 Lumparland	1,501	140.0	192	185.4	1,693	145.1	2,289	107.0	217	169.8	2,506	112.4
478 Mariehamn	410	108.5	49	169.5	459	115.1	576	88.6	56	156.5	631	94.6
736 Saltvik	5,459	145.1	772	194.4	6,231	151.2	8,816	104.4	878	176.6	9,694	110.9
766 Sottunga	783	98.1	91	143.5	874	102.9	1,297	72.4	97	138.8	1,393	77.0
771 Sund	4,507	1,380	650	187.8	5,157	144.2	6,666	106.4	724	174.1	7,390	113.1
941 Vårdö	3,312	132.2	420	179.1	3,732	137.4	6,048	88.8	476	163.8	6,524	94.3
Total	58,728	132.1	9,066	180.4	67,794	138.5	88,168	100.1	9,964	169.5	98,132	107.2
<b>Rannikko/Etelärannikko</b>												
<i>Municipality</i>												
40 Dragsfjärd	13,782	140.3	1,310	169.0	15,092	142.8	17,726	117.5	1,475	151.6	19,201	120.1
49 Espoo-Esbo	1,303	166.6	1,953	153.7	15,256	165.0	14,600	154.8	1,990	150.8	16,591	154.3
78 Hanko-Hangö	5,831	140.5	1,013	125.6	6,845	138.3	7,389	119.3	1,082	119.3	8,472	119.3
91 Helsinki-Helsingfors	5,805	137.9	721	131.0	6,526	137.2	6,043	133.7	753	125.6	6,796	132.8
92 Vantaa-Vanda	8,756	158.7	1,358	148.8	10,113	157.4	9,036	154.6	1,398	144.6	10,434	153.3

(continued)

Table 2b (continued)

	Forest land						Forest and poorly productive forest land					
	Mineral soil		Peatland		Total		Mineral soil		Peatland		Total	
	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)
101	6,617	127.4	165	90.5	6,782	126.5	9,115	105.1	199	77.4	9,314	104.5
149	15,526	169.3	1,846	174.5	17,372	169.8	18,813	148.7	1,872	172.2	20,685	150.8
150	3,565	142.3	127	100.7	3,692	140.9	5,131	111.6	166	78.1	5,298	110.6
220	9,855	151.0	1,439	155.9	11,293	151.7	10,625	143.5	1,471	152.7	12,096	14.6
235	167	157.6	34	155.4	201	157.2	184	146.5	34	153.3	219	147.6
Grankulla												
243	15,388	136.5	2,002	163.7	17,390	139.6	17,723	123.2	2,241	148.6	19,964	126.0
257	16,545	159.8	2,169	170.9	18,714	161.1	20,014	140.7	2,245	165.2	22,259	143.2
Kyrkslätt												
279	8,013	121.5	387	103.7	8,400	120.7	11,514	98.0	421	97.0	11,935	98.0
407	15,157	157.0	2,083	139.3	17,240	154.8	15,866	152.2	2,144	135.4	18,010	150.2
Lapträsk												
424	5,056	152.7	702	133.3	5,759	150.4	5,318	147.6	707	132.5	6,024	145.9
434	2,390	159.9	357	132.8	2,747	156.4	2,536	154.5	359	131.8	2,895	151.7
533	12,280	130.4	726	141.1	13,006	131.0	17,067	105.5	909	113.3	17,975	105.9
573	13,489	126.9	1,064	122.5	14,554	126.6	16,076	111.6	1,226	106.9	17,302	111.2
585	22,431	148.8	3,392	134.1	25,824	146.9	23,714	143.5	3,429	132.6	27,142	142.1
606	12,767	132.7	2,131	140.6	14,898	133.8	14,191	123.5	2,274	133.3	16,465	124.8
638	32,411	159.4	4,019	124.5	36,430	155.6	34,523	153.0	4,096	122.2	38,618	149.7
701	13,305	149.4	2,753	127.1	16,058	145.6	14,030	144.4	2,757	126.9	16,787	141.5
Strömfors												
753	17,330	169.5	2,261	143.7	19,591	166.5	18,140	164.2	2,342	138.7	20,482	161.3
755	11,160	174.3	1,252	175.9	12,412	174.5	12,125	162.6	1,272	173.1	13,397	163.6
835	38,379	136.4	5,388	144.7	43,767	137.4	46,334	121.2	5,856	135.4	52,190	122.8
923	5,167	135.8	535	166.7	5,701	138.7	6,264	119.5	639	143.7	6,904	121.7
Total	324,477	148.6	41,186	144.4	365,663	148.1	374,098	134.7	43,356	137.9	417,454	135.1

<b>Rannikko/Pohjanmaa</b>													
<i>Municipality</i>													
231	Kaskinen-Kaskö	589	108.9	57	107.0	646	108.7	625	104.3	66	97.7	691	103.7
272	Kokkola-Karleby	14,374	103.6	6,509	101.9	20,883	103.1	14,754	101.8	7,333	92.1	22,086	98.5
280	Korsnäs	13,904	106.8	3,518	93.4	17,422	104.1	14,016	106.2	3,831	88.2	17,847	102.4
287	Kristinestad-Kristiinankristiinankaupunki	36,114	117.7	11,394	115.4	47,508	117.2	36,674	116.4	12,363	107.6	49,037	114.2
288	Kronoby-Kruunupyö	29,158	107.0	19,653	94.7	48,811	102.1	29,799	105.4	22,705	84.4	52,505	96.3
440	Larsmo-Luoto	6,990	93.2	2,739	91.1	9,729	92.6	7,331	90.8	3,187	80.5	10,518	87.7
475	Malax-Maalathi	25,466	103.4	9,842	81.1	35,308	97.2	25,760	102.6	11,070	74.6	36,830	94.2
499	Korsholm-Mustasaari	45,686	109.2	8,264	91.1	53,950	106.4	46,436	107.8	10,497	76.8	56,932	102.1
545	Närpes-Närpiö	44,442	116.3	19,795	107.3	64,237	113.5	45,156	115.0	22,079	97.5	67,235	109.2
559	Oravais-Oravainen	8,956	101.5	3,701	90.2	12,657	98.2	9,456	97.9	4,300	80.7	13,756	92.5
598	Jakobstad-Pietarsaari	3,918	93.3	1,636	98.9	5,554	95.0	4,061	91.1	1,858	89.1	5,920	90.5
599	Pedersöre-Pedersörenkunta	33,127	101.3	21,107	90.8	54,234	97.2	33,981	99.4	24,307	81.2	58,288	91.8
893	Nykarleby-Uusikaarlepyy	32,181	92.1	16,672	87.1	48,853	90.4	33,271	90.0	18,926	78.8	52,198	85.9
905	Vaasa-Vasa	8,765	122.1	1,243	94.8	10,008	118.7	8,916	120.4	1,360	89.7	10,277	116.3
945	Vöörä-Maxmo-Vöyri-Maksamaa	29,599	112.6	9,178	104.4	38,777	110.7	30,587	110.4	9,974	98.4	40,561	107.5
Total		333,268	107.6	135,310	96.4	468,578	104.3	340,823	105.9	153,856	87.0	494,679	100.0
<b>Lounais-Suomi</b>													
<i>Municipality</i>													
6	Alastaro	9,170	146.2	2,759	154.1	11,929	148.0	9,387	143.4	2,943	145.9	12,330	144.0
17	Askainen	2,636	144.7	186	139.3	2,821	144.4	2,928	134.1	208	132.2	3,137	134.0
19	Aura	3,336	150.1	619	150.5	3,955	150.2	3,441	146.3	667	142.4	4,108	145.7
50	Eura	22,065	143.1	6,273	145.2	28,339	143.6	22,598	140.5	6,749	137.1	29,347	139.7
51	Eurajoki	17,983	147.6	3,629	149.9	21,612	148.0	18,422	144.8	3,868	142.3	22,290	144.3

(continued)

Table 2b (continued)

	Forest land				Forest and poorly productive forest land							
	Mineral soil		Peatland		Mineral soil		Peatland		Total			
	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)		
73	15,857	153.8	2,074	143.4	17,931	152.6	16,790	147.0	2,301	134.3	19,090	145.5
79	5,144	140.8	1,981	132.1	7,124	138.4	5,280	137.8	2,140	124.6	7,419	134.0
99	11,861	99.6	9,425	84.6	21,286	92.9	11,883	99.5	10,772	75.5	22,655	88.1
102	14,925	156.0	4,891	145.0	19,817	153.3	15,024	155.1	5,485	131.9	20,509	148.9
181	8,997	129.0	3,662	103.8	12,659	121.7	9,164	127.1	4,083	94.8	13,247	117.1
202	2,000	134.3	133	124.0	2,133	133.6	2,287	122.6	148	121.8	2,435	122.5
214	28,263	122.2	17,430	95.7	45,693	112.1	28,450	121.6	19,663	86.6	48,113	107.3
230	16,412	101.7	15,674	84.2	32,087	93.2	16,450	101.6	18,055	74.6	34,506	87.5
252	11,512	157.7	2,524	145.4	14,036	155.5	11,970	152.9	2,783	135.0	14,753	149.5
254	7,096	142.3	2,083	118.7	9,179	136.9	7,136	141.6	2,326	108.3	9,462	133.4
259	13,947	154.2	2,952	150.2	16,899	153.5	14,517	149.3	3,184	142.0	17,702	148.0
262	5,524	145.4	1,269	154.4	6,792	147.1	5,595	143.9	1,320	149.7	6,915	145.0
271	21,839	143.5	6,935	131.5	28,774	140.6	22,112	142.1	7,512	123.6	29,624	137.4
284	6,006	162.6	1,948	173.3	7,954	165.2	6,097	160.5	2,074	163.9	8,171	161.4
304	8,519	141.5	556	164.2	9,075	142.8	10,991	119.1	683	136.7	11,674	120.1
308	3,796	165.8	871	160.1	4,667	164.7	3,853	163.6	911	154.7	4,763	161.9
319	10,431	141.5	4,297	138.5	14,728	140.6	10,715	138.4	4,887	125.2	15,602	134.3
400	26,113	144.3	6,306	144.9	32,419	144.4	27,010	140.6	7,074	131.6	34,084	138.7
406	10,975	141.2	2,403	141.8	13,377	141.3	11,487	136.3	2,556	134.6	14,043	136.0
413	17,395	136.1	5,640	118.9	23,035	131.9	17,480	135.6	6,350	107.8	23,830	128.2
419	1,674	127.4	122	110.1	1,796	126.2	1,819	120.0	129	110.5	1,947	119.4
423	7,642	149.5	1,207	158.8	8,849	150.8	8,094	142.8	1,302	150.3	9,395	143.9
430	13,184	162.3	4,626	174.7	17,811	165.5	13,424	159.9	5,028	162.3	18,452	160.5
442	10,361	168.0	1,523	172.5	11,884	168.5	10,436	167.0	1,584	166.8	12,021	166.9
480	7,084	154.6	2,016	141.4	9,100	151.6	7,240	151.7	2,226	130.7	9,465	146.8
481	3,748	133.1	516	143.2	4,264	134.4	4,127	124.6	556	138.7	4,683	126.3
482	2,576	153.6	991	148.6	3,567	152.2	2,616	151.6	1,198	127.0	3,814	143.9
484	23,569	130.3	8,876	111.5	32,445	125.1	23,778	129.5	9,446	105.8	33,224	122.8



485	Merimasku	2,507	148.7	150	183.7	2,657	150.7	2,917	133.7	162	173.7	3,079	135.8
501	Muura	3,463	154.7	694	155.8	4,156	154.9	3,640	148.5	737	148.6	4,377	148.5
503	Mynämäki	23,863	136.5	7,378	131.1	31,242	135.2	24,851	132.3	8,329	119.6	33,179	129.1
529	Naantali	2,274	141.4	97	158.8	2,371	142.1	2,634	127.8	113	144.9	2,747	128.5
531	Nakkila	6,833	147.9	1,897	158.5	8,730	150.2	6,895	146.8	1,994	152.4	8,889	148.0
537	Noormarkku	18,383	144.8	6,039	136.0	24,421	142.6	18,552	143.8	6,707	124.9	25,259	138.8
538	Nousiainen	8,790	151.8	1,992	147.6	10,782	151.0	9,328	144.8	2,194	137.3	11,522	143.4
561	Oripää	4,017	138.9	1,540	143.6	5,558	140.2	4,143	135.4	1,630	137.4	5,774	136.0
577	Paimio	9,976	146.5	1,168	145.9	11,144	146.4	11,049	135.4	1,268	139.2	12,316	135.8
586	Perniö	19,188	158.2	3,929	156.4	23,117	157.9	20,306	151.2	4,344	143.9	24,651	149.9
587	Pertteli	5,609	154.9	1,017	152.4	6,626	154.5	5,861	149.4	1,064	147.8	6,925	149.2
602	Piikkiö	3,564	143.2	250	142.0	3,813	143.1	3,968	132.2	279	135.5	4,247	132.4
608	Pomarkku	16,798	159.1	5,909	141.5	22,706	154.5	16,955	158.0	6,576	129.5	23,532	150.0
609	Pori	23,677	143.6	4,542	146.5	28,219	144.0	23,944	142.3	4,790	140.2	28,735	141.9
631	Pyhäranta	8,410	152.0	1,172	153.5	9,582	152.2	8,755	147.3	1,240	146.8	9,994	147.3
636	Pöytyä	16,184	150.5	4,341	145.0	20,526	149.4	16,534	147.9	4,921	131.6	21,455	144.1
680	Raisio	1,716	133.8	135	128.9	1,852	133.4	1,925	124.2	153	124.1	2,078	124.2
684	Rauma	15,766	144.0	2,138	149.5	17,904	144.7	16,706	137.8	2,244	143.8	18,949	138.5
704	Rusko	1,969	135.3	292	144.3	2,262	136.4	2,117	128.7	307	143.8	2,424	130.6
705	Rymättylä	6,878	141.8	285	133.4	7,163	141.5	9,059	117.1	346	115.8	9,404	117.0
734	Salo	6,323	147.8	1,080	147.8	7,403	147.8	6,591	142.9	1,130	143.7	7,720	143.0
738	Sauvo	10,953	135.4	993	129.7	11,946	135.0	12,240	125.1	1,068	125.6	13,309	125.1
747	Siikainen	23,029	130.1	10,899	104.0	33,928	121.7	23,262	129.1	11,865	96.8	35,127	118.2
761	Somero	26,056	160.7	7,118	165.7	33,174	161.8	26,512	158.6	7,549	157.6	34,061	158.4
776	Suomusjärvi	9,236	150.2	1,691	150.9	10,927	150.3	9,662	145.2	1,823	142.8	11,486	144.8
783	Säkylä	7,305	140.8	2,341	143.1	9,646	141.3	7,693	135.2	2,561	133.6	10,254	134.8
784	Särkisalo-Finby	4,805	155.4	509	153.8	5,314	155.3	5,180	147.1	540	148.8	5,720	147.2
833	Taivassalo	5,934	139.9	283	159.5	6,217	140.8	7,207	122.1	320	151.0	7,527	123.3
838	Tarvasjoki	3,756	153.3	601	150.4	4,357	152.9	3,853	150.0	634	145.3	4,487	149.3
853	Turku-Åbo	7,948	132.4	854	123.0	8,802	131.5	8,994	122.1	936	119.1	9,930	121.8
886	Ulvila	20,119	139.2	7,244	134.8	27,364	138.1	20,286	138.3	8,148	122.5	28,434	133.8
895	Uusikaupunki	25,758	128.9	2,653	123.8	28,411	128.4	28,497	120.1	2,853	119.0	31,350	120.0

(continued)

Table 2b (continued)

	Forest land						Forest and poorly productive forest land						
	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	
	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		(m <sup>3</sup> /ha)
906	Vahto	3,310	150.8	866	141.5	4,177	148.9	3,428	146.6	968	130.7	4,396	143.1
913	Vampula	5,063	160.3	1,670	152.2	6,733	158.3	5,098	159.4	1,722	148.3	6,820	156.6
918	Vehmaa	8,319	129.6	848	107.3	9,167	127.5	9,067	122.0	918	104.4	9,985	120.4
920	Velkua	1,634	136.7	50	150.5	1,684	137.1	2,234	110.6	55	140.4	2,289	111.3
979	Yläne	17,175	144.7	6,587	130.7	23,763	140.8	17,790	140.6	7,665	116.5	25,455	133.3
Total		758,227	142.9	217,651	129.0	975,878	139.8	790,336	138.5	240,362	119.1	1,030,698	134.0
<b>Häme-Uusimaa</b>													
<i>Municipality</i>													
15	Artjärvi	8,899	146.6	555	151.1	9,454	146.9	9,222	141.8	571	147.1	9,793	142.1
16	Asikkala	37,907	161.3	5,093	129.8	43,000	157.6	38,202	160.3	5,408	124.1	43,610	155.8
18	Askola	10,824	162.9	1,336	192.2	12,160	166.1	10,987	160.5	1,366	188.0	12,353	163.6
61	Forssa	10,450	159.1	3,301	145.5	13,752	155.8	10,453	159.1	3,485	138.6	13,938	153.9
81	Hartola	38,156	160.8	5,786	123.3	43,942	155.9	38,176	160.7	6,126	118.3	44,302	154.9
82	Hattula	18,172	149.9	7,149	134.7	25,321	145.6	18,188	149.8	7,591	128.4	25,778	143.5
83	Hauho	20,564	182.9	4,013	145.6	24,577	176.8	20,609	182.5	4,206	140.4	24,815	175.4
86	Hausjärvi	17,035	161.2	3,031	144.4	20,066	158.6	17,138	160.3	3,279	134.8	20,417	156.2
98	Hollola	27,242	151.4	2,472	127.8	29,714	149.5	27,344	151.0	2,643	120.8	29,987	148.3
103	Humpilla	5,542	162.7	1,643	183.0	7,185	167.3	5,587	161.4	1,748	173.2	7,335	164.2
106	Hyvinkää	15,238	160.6	4,203	141.6	19,441	156.5	15,431	158.8	4,446	135.0	19,876	153.5
109	Hämeenlinna	8,643	152.4	2,089	156.4	10,732	153.2	8,667	152.0	2,178	151.5	10,845	151.9
111	Heinola	50,807	148.4	6,056	104.6	56,862	143.7	51,650	146.6	6,524	98.7	58,174	141.2
165	Janakkala	26,504	165.5	7,090	148.9	33,594	162.0	26,595	165.0	7,468	142.8	34,062	160.1
169	Jokioinen	6,822	166.5	1,200	170.4	8,022	167.1	6,831	166.3	1,243	165.1	8,074	166.1
186	Järvenpää	1,386	139.8	111	140.4	1,497	139.8	1,406	138.0	115	134.9	1,521	137.8
210	Kalvola	16,421	147.4	5,897	147.0	22,318	147.3	16,422	147.4	6,091	143.2	22,512	146.3
223	Karjalohja	6,513	135.1	1,099	150.4	7,612	137.3	6,676	132.8	1,149	144.6	7,825	134.5
224	Karkkila	13,055	163.8	3,150	157.5	16,205	162.6	13,125	163.0	3,206	155.1	16,331	161.5
245	Kerava	1,311	150.4	148	157.8	1,459	151.2	1,326	149.2	150	155.6	1,476	149.8

283	Hämeenkoski	10,595	156.3	1,332	142.0	11,927	154.7	10,607	156.2	1,383	137.5	11,990	154.0
316	Kärkölä	11,738	162.3	1,869	139.9	13,607	159.2	11,748	162.2	2,095	126.6	13,843	156.8
398	Lahti	7,368	137.2	554	99.9	7,922	134.6	7,456	136.0	596	94.2	8,052	132.9
401	Lammi	32,452	154.5	6,792	139.7	39,244	152.0	32,485	154.4	7,093	135.0	39,578	150.9
433	Loppi	30,521	161.7	11,038	149.8	41,559	158.6	30,606	161.3	11,401	145.9	42,007	157.2
444	Lojja-Lojo	15,094	156.4	1,089	131.6	16,183	154.7	15,195	155.4	1,096	130.7	16,291	153.7
504	Mäntsylä-Mörskom	11,116	154.6	1,250	175.9	12,366	156.7	11,383	151.1	1,288	170.8	12,670	153.1
505	Mäntsälä	28,325	176.0	5,007	145.8	33,332	171.4	28,556	174.7	5,388	136.4	33,944	168.6
532	Nastola	20,523	140.5	2,150	97.2	22,673	136.4	21,166	137.2	2,362	89.8	23,529	132.4
540	NummiPusula	24,872	145.9	4,686	149.1	29,559	146.4	25,029	145.2	4,793	146.2	29,822	145.3
543	Nurmijärvi	15,756	159.5	2,080	144.2	17,836	157.7	16,043	156.9	2,131	140.9	18,174	155.0
560	Orimattila	32,480	140.6	2,322	128.7	34,803	139.8	33,090	138.3	2,488	120.7	35,578	137.1
576	Padasjoki	36,834	166.1	7,585	150.8	44,419	163.5	36,868	165.9	7,815	147.3	44,683	162.7
611	Pornainen	7,294	156.7	1,229	151.1	8,523	155.9	7,400	154.6	1,267	146.5	8,668	153.4
616	Pukkila	6,713	147.4	749	163.8	7,463	149.0	6,792	145.7	777	158.1	7,569	147.0
692	Renko	13,556	161.9	5,323	156.9	18,879	160.5	13,581	161.7	5,637	149.7	19,218	158.1
694	Riihimäki	5,593	163.3	1,126	147.2	6,719	160.6	5,644	162.1	1,184	140.9	6,828	158.4
737	Sammatti	3,956	132.9	519	153.5	4,475	135.3	4,036	131.0	549	146.0	4,584	132.8
781	Sysmä	47,012	166.2	5,223	120.0	52,235	161.5	47,111	165.8	5,412	117.0	52,523	160.8
834	Tammela	29,709	155.9	14,068	140.4	43,777	150.9	29,709	155.9	14,914	133.2	44,623	148.3
855	Tuulos	9,795	155.2	2,203	136.2	11,998	151.7	9,834	154.7	2,316	131.0	12,149	150.2
858	Tuusula	9,279	162.0	1,275	151.1	10,554	160.7	9,437	159.6	1,314	146.6	10,751	158.0
927	Vihti	28,413	167.0	3,596	146.7	32,009	164.7	28,644	165.8	3,701	142.7	32,345	163.1
981	Ypäjä	6,497	169.1	1,428	185.5	7,925	172.1	6,525	168.4	1,505	177.0	8,030	170.0
Total		786,985	157.9	149,914	142.1	936,899	155.4	792,978	156.9	157,497	136.3	950,475	153.5
<b>Kaakkois-Suomi</b>													
<i>Municipality</i>													
44	Elimäki	16,912	150.4	2,528	139.8	19,440	149.0	17,131	149.0	2,626	136.2	19,757	147.3
75	Hamina	35,704	136.8	8,066	133.6	43,769	136.2	36,463	135.0	8,412	129.4	44,875	134.0
142	Iitti	33,958	139.1	5,504	131.6	39,462	138.1	34,530	137.4	5,742	127.7	40,272	136.0
153	Imatra	8,106	151.2	1,458	141.9	9,564	149.8	8,143	150.8	1,479	140.1	9,622	149.2
163	Jaala	29,545	154.2	5,232	129.5	34,776	150.4	30,082	152.3	5,355	127.1	35,437	148.5

(continued)

Table 2b (continued)

	Forest land						Forest and poorly productive forest land						
	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	
	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		
173	Joutseno	16,410	157.5	3,737	143.4	20,147	154.9	16,413	157.5	3,856	139.4	20,268	154.1
285	Kotka	14,898	137.1	3,032	125.8	17,930	135.2	15,381	134.4	3,234	119.2	18,615	131.7
286	Kouvola	1,813	116.8	308	132.7	2,121	119.1	1,832	116.0	319	129.9	2,150	118.1
306	Kuusankoski	5,645	136.6	1,202	130.1	6,847	135.5	5,706	135.5	1,233	127.9	6,939	134.2
405	Lappeenranta	42,299	148.9	11,408	138.7	53,707	146.8	42,314	149.0	11,725	135.4	54,039	146.0
416	Lemi	12,957	160.2	2,867	136.0	15,824	155.8	13,012	159.8	2,931	133.5	15,943	154.9
441	Luumäki	42,741	147.1	16,023	129.0	58,765	142.2	43,056	146.6	16,718	124.4	59,774	140.4
489	Michikkälä	25,521	131.8	6,265	128.3	31,786	131.1	25,694	131.1	6,574	123.0	32,268	129.5
580	Parikkala	35,232	123.0	6,801	123.1	42,033	123.0	35,298	123.0	6,974	120.5	42,273	122.6
624	Pyhtää-Pyttis	16,812	149.1	3,518	109.5	20,329	142.3	17,302	146.2	4,099	96.8	21,401	136.8
689	Rautjärvi	23,067	146.0	4,936	136.9	28,004	144.4	23,112	145.9	5,035	134.6	28,147	143.9
700	Ruokolahti	62,775	146.8	16,010	124.5	78,786	142.2	63,305	145.9	16,497	121.3	79,802	140.8
739	Savitaipale	33,893	156.5	7,926	125.6	41,818	150.6	34,355	155.1	8,212	122.0	42,567	148.7
754	Anjalankoski	37,366	136.9	10,694	131.7	48,060	135.7	37,903	135.5	11,399	125.2	49,302	133.2
775	Suomenniemi	21,088	140.5	31,666	121.0	24,254	138.0	21,412	139.2	3,326	116.5	24,739	136.1
831	Taipalsaari	23,043	153.0	4,578	131.9	27,621	149.5	23,182	152.5	4,713	128.4	27,895	148.4
909	Valkaala	50,601	145.3	12,917	125.7	63,518	141.3	51,420	143.8	13,448	121.6	64,869	139.2
935	Virolahti	22,320	121.5	4,090	122.7	26,409	121.6	22,678	120.2	4,372	115.8	27,050	119.5
978	Ylämaa	24,303	134.5	6,139	126.8	30,442	132.9	24,414	134.0	6,488	120.8	30,902	131.3
Total		637,007	143.2	148,405	129.3	785,412	140.6	644,139	142.2	154,768	124.8	798,907	138.8
<b>Pirkanmaa</b>													
<i>Municipality</i>													
20	Akaa	4,637	131.7	861	132.3	5,498	131.8	4,650	131.4	898	127.6	5,548	130.8
108	Hämeenkyrö	25,287	146.8	6,488	123.7	31,776	142.1	25,349	146.5	6,920	117.1	32,269	140.2
143	Ikaalinen	41,722	130.4	13,928	116.6	55,650	126.9	41,913	129.9	15,077	109.0	56,990	124.4
177	Juupajoki	16,130	145.3	3,989	138.7	20,120	144.0	16,192	144.9	4,181	133.3	20,373	142.5
211	Kangasala	29,906	143.7	5,259	133.8	35,165	142.3	30,049	143.2	5,474	129.3	35,523	141.1
250	Kihniö	15,059	114.6	11,891	101.5	26,950	108.8	15,202	113.7	12,801	95.6	28,003	105.4

289	Kuhmalahti	10,631	154.4	2,340	148.7	12,971	153.3	10,692	153.7	2,426	144.1	13,118	151.9
303	Kuru	43,212	136.4	16,097	122.8	59,309	132.7	43,381	135.9	17,453	114.7	60,834	129.8
310	Kylmäkoski	9,313	147.6	2,324	142.5	11,637	146.6	9,340	147.2	2,423	137.5	11,763	145.2
418	Lempäälä	16,195	153.8	2,706	139.5	18,902	151.7	16,221	153.6	2,784	136.2	19,005	151.0
493	Mouhijärvi	14,897	136.5	2,889	122.5	17,786	134.3	14,949	136.2	3,067	116.6	18,015	132.8
506	Mänttä	3,621	155.5	997	145.1	4,617	153.3	3,634	155.1	1,022	142.1	4,656	152.2
536	Nokia	18,027	142.1	2,698	123.0	20,725	139.6	18,071	141.8	2,819	118.5	20,890	138.7
562	Orivesi	52,531	145.1	9,648	132.4	62,179	143.1	52,694	144.7	10,132	127.0	62,826	141.8
581	Parkano	37,896	112.5	25,281	99.7	63,177	107.4	38,117	112.0	28,889	89.4	67,006	102.2
604	Pirkkala	4,802	147.0	664	129.8	5,466	144.9	4,809	146.9	686	126.5	5,495	144.3
619	Punkalaidun	14,132	163.4	4,781	169.3	18,914	164.9	14,327	161.5	5,218	156.8	19,545	160.3
635	Pälkäne	35,798	167.4	6,161	152.8	41,958	165.2	36,012	166.6	6,338	149.2	42,350	164.0
702	Ruovesi	51,486	152.9	10,516	133.5	62,002	149.6	51,707	152.4	11,211	126.3	62,918	147.7
837	Tampere	31,491	152.2	5,697	136.2	37,188	149.7	31,572	151.8	5,929	131.6	37,501	148.6
887	Urijala	24,047	152.4	7,053	141.4	31,101	149.9	24,153	151.9	7,535	133.5	31,688	147.5
908	Valkeakoski	14,870	150.7	2,598	133.1	17,468	148.1	14,922	150.3	2,702	128.8	17,624	147.0
912	Vammala	45,890	137.3	10,378	126.7	56,268	135.3	46,065	136.9	11,017	120.4	57,082	133.7
922	Vesilähti	18,210	158.4	3,225	137.7	21,435	155.3	18,262	158.1	3,358	133.0	21,620	154.2
933	Vilppula	30,578	152.8	7,459	139.3	38,037	150.1	30,712	152.2	7,714	135.4	38,426	148.8
936	Virrat	64,346	121.5	26,901	106.3	91,247	117.0	64,760	120.9	29,100	99.6	93,860	114.3
980	Ylöjärvi	23,887	145.1	5,205	131.8	29,092	142.7	23,946	144.8	5,453	126.7	29,399	141.5
988	Äetsä	13,374	127.4	2,775	125.1	16,149	127.0	13,440	127.0	2,922	119.7	16,363	125.7
Total		711,977	141.9	200,810	123.1	912,787	137.7	715,142	141.3	215,551	115.9	930,693	135.5
<b>Etelä-Savo</b>													
<i>Municipality</i>													
46	Enonkoski	23,743	137.2	4,813	133.6	28,556	136.6	23,834	136.8	4,870	132.2	28,704	136.0
90	Heinävesi	80,143	128.2	14,708	112.4	94,851	125.8	80,143	128.2	15,290	109.0	95,433	125.1
97	Hirvensalmi	34,123	147.1	5,998	108.4	40,121	141.3	34,274	146.6	6,503	101.9	40,777	139.5
171	Joroinen	33,115	143.7	12,856	114.9	45,972	135.7	33,140	143.6	13,658	109.5	46,797	133.7
178	Juva	73,568	147.0	25,183	116.3	98,751	139.2	73,867	146.6	26,866	110.7	100,733	137.1
213	Kangasniemi	68,904	141.0	22,434	116.0	91,338	134.9	69,031	140.8	23,875	110.4	92,906	133.0
246	Kerimäki	38,032	133.8	11,462	127.6	49,494	132.3	38,257	133.4	11,958	123.0	50,215	131.0
491	Mikkeli	111,691	143.3	30,078	116.4	141,769	137.6	112,044	142.9	32,867	108.1	144,910	135.0

(continued)

Table 2b (continued)

	Forest land						Forest and poorly productive forest land						
	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	
	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		
507	Mäntyharju	68,897	130.3	15,736	120.6	84,632	128.5	69,520	129.6	16,527	115.8	86,047	126.9
588	Pertunmaa	27,418	136.1	4,536	110.2	31,954	132.4	27,450	135.9	4,868	104.4	32,319	131.2
593	Pieksämäki	91,041	133.6	42,840	117.5	133,880	128.4	91,180	133.4	46,033	110.8	137,212	125.8
618	Punkaharju	35,061	147.0	8,004	131.8	43,065	144.2	35,186	146.8	8,206	129.0	43,392	143.4
623	Puumala	62,721	135.7	8,315	118.4	71,036	133.7	64,096	134.3	8,607	114.9	72,703	132.0
681	Rantasalmi	36,834	131.4	9,344	125.3	46,178	130.2	36,854	131.4	9,654	122.0	46,509	129.5
696	Ristiina	41,631	140.7	6,914	124.0	48,545	138.3	42,091	139.8	7,255	119.1	49,346	136.8
740	Savonlinna	59,950	135.4	10,691	129.2	70,641	134.5	60,680	134.7	10,905	127.0	71,585	133.5
741	Savonranta	28,913	133.2	5,797	116.6	34,710	130.4	28,913	133.2	5,897	115.0	34,811	130.1
768	Sulkava	42,186	135.3	8,592	118.2	50,778	132.4	42,600	134.6	8,794	115.9	51,394	131.4
Total		957,971	137.6	248,302	118.8	1,206,273	133.7	963,162	137.2	262,630	113.5	1,225,792	132.1
<b>Etelä-Pohjanmaa</b>													
<i>Municipality</i>													
4	Alahärmä	11,250	84.1	7,618	85.1	18,868	84.5	12,374	79.1	8,698	76.9	21,071	78.2
5	Alajärvi	27,842	102.6	23,006	81.1	50,848	92.9	28,712	100.3	26,807	71.4	55,519	86.3
10	Alavus	30,357	107.3	22,812	86.8	53,169	98.5	31,127	105.4	25,719	78.4	56,846	93.2
52	Evijärvi	12,543	103.1	12,233	82.7	24,776	93.0	12,720	102.0	14,064	73.8	26,784	87.2
74	Halsua	16,232	85.9	11,382	54.9	27,614	73.2	16,404	85.2	14,833	44.0	31,236	65.6
95	Himanka	9,105	108.3	7,540	93.6	16,645	101.6	9,229	107.3	8,332	86.2	17,561	97.3
145	Ilimajoki	22,936	113.0	11,922	94.2	34,858	106.6	22,988	112.8	13,162	86.8	36,151	103.4
151	Isojoki	27,880	115.8	18,893	86.5	46,773	104.0	28,284	114.4	22,806	73.5	51,090	96.2
152	Isokyrö	12,502	99.7	6,559	85.2	19,061	94.7	12,728	98.9	7,555	76.7	20,283	90.7
164	Jalasjärvi	29,683	107.6	20,846	86.8	50,529	99.0	30,498	105.4	23,508	78.4	54,006	93.6
175	Jurva	20,761	116.1	10,460	89.6	31,221	107.2	20,888	115.6	12,057	79.6	32,945	102.4
217	Kannus	14,378	96.9	13,916	88.9	28,294	93.0	14,595	95.9	15,585	80.8	30,180	88.1
218	Karijoki	7,886	110.6	4,212	90.4	12,098	103.6	7,967	109.8	4,998	78.3	12,965	97.6
232	Kauhajoki	43,704	88.6	38,941	73.8	82,645	81.6	45,011	87.0	47,047	62.6	92,058	74.5
233	Kauhava	15,999	100.0	12,502	86.8	28,501	94.2	16,311	98.6	14,033	79.0	30,343	89.6

236	Kaustinen	12,246	96.6	10,955	67.1	23,201	82.7	12,433	95.4	13,829	56.2	26,262	74.8
281	Kortesjärvi	12,378	93.4	9,828	82.6	22,206	88.6	12,596	92.2	11,131	75.1	23,727	84.2
300	Kuortane	18,668	110.9	12,918	93.6	31,586	103.8	18,956	109.6	14,686	84.2	33,642	98.5
301	Kurikka	18,530	103.9	8,749	90.9	27,280	99.7	18,709	103.2	10,145	80.1	28,853	95.0
315	Kälviä	24,656	101.5	20,429	75.4	45,085	89.7	25,089	100.2	25,930	61.9	51,019	80.8
399	Laihia	21,029	118.5	11,567	83.6	32,596	106.1	21,180	118.0	13,200	75.5	34,381	101.7
403	Lappajärvi	14,214	107.9	14,556	85.4	28,770	96.5	14,389	106.8	16,547	76.7	30,936	90.6
408	Lappua	25,419	111.1	17,337	85.8	42,756	100.8	25,739	110.0	20,363	75.2	46,102	94.7
414	Lehtimäki	9,814	107.6	8,256	79.5	18,070	94.8	10,055	105.6	10,408	66.3	20,463	85.6
421	Lestijärvi	18,777	96.2	14,426	68.6	33,203	84.2	19,028	95.2	18,745	55.2	37,773	75.3
429	Lohtaja	16,836	90.5	12,068	82.3	28,904	87.1	17,299	88.9	14,602	71.0	31,901	80.7
544	Nurmo	13,133	102.1	10,054	77.1	23,187	91.2	13,239	101.4	11,704	68.5	24,943	86.0
584	Perho	30,027	83.1	22,970	46.0	52,997	67.0	30,251	82.6	27,298	39.9	57,549	62.3
743	Seinäjoki	18,843	98.0	15,852	82.4	34,695	90.9	19,163	96.8	17,750	75.1	36,914	86.3
759	Soini	23,409	112.4	17,161	79.9	40,570	98.6	23,817	110.9	20,329	69.2	44,146	91.7
846	Teuva	22,642	107.9	13,236	89.0	35,878	101.0	22,800	107.4	15,846	76.3	38,646	94.7
849	Toholampi	21,408	108.5	14,722	73.1	36,130	94.1	21,548	107.9	18,837	59.0	40,384	85.1
863	Töysä	13,808	113.3	7,506	93.2	21,314	106.2	14,110	111.7	8,267	85.9	22,376	102.2
885	Ullava	6,070	107.9	4,669	70.8	10,740	91.8	6,129	107.1	5,771	59.1	11,900	83.8
924	Veteli	15,417	114.2	17,374	75.4	32,791	93.7	15,588	113.3	21,354	64.1	36,942	84.8
934	Vimpeli	9,620	107.5	9,250	77.0	18,871	92.5	9,832	105.7	10,876	67.1	20,708	85.4
942	Vähäkylä	7,035	99.6	1,863	100.2	8,897	99.7	7,184	98.6	1,908	98.5	9,092	98.6
971	Ylihärmä	4,019	93.8	2,803	88.4	6,822	91.6	4,435	88.1	3,391	75.8	7,826	82.8
975	Ylistaro	18,777	101.6	9,028	86.7	27,805	96.7	19,103	100.4	10,474	77.1	29,577	92.2
989	Ähtäri	40,286	108.0	23,709	88.8	63,995	100.9	40,924	106.7	26,205	81.6	67,128	96.9
Total		740,119	103.6	534,127	80.6	1,274,246	93.9	753,429	102.2	628,798	70.3	1,382,227	87.7
<b>Keski-Suomi</b>													
<i>Municipality</i>													
77	Hankasalmi	37,878	144.0	8,255	113.6	46,133	138.6	37,878	144.0	8,427	111.3	46,304	138.1
172	Joutsa	34,617	144.8	6,067	120.5	40,684	141.1	34,686	144.5	6,285	117.1	40,971	140.3
179	Jyväskylä	6,289	134.5	772	116.7	7,060	132.5	6,316	134.0	782	115.8	7,098	132.0
180	Jyväskylän mlk	30,430	137.7	5,080	114.0	35,511	134.3	30,499	137.4	5,247	111.3	35,746	133.5
182	Jämsä	80,194	142.7	15,640	126.4	95,834	140.1	80,577	142.2	16,172	123.2	96,749	139.0

(continued)

Table 2b (continued)

	Forest land						Forest and poorly productive forest land						
	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	
	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		
183	Jämsänkoski	28,119	126.4	5,918	108.9	34,037	123.3	28,222	126.1	6,268	104.5	34,489	122.1
216	Kannonkoski	30,313	113.1	8,743	99.5	39,056	110.1	30,521	112.7	9,125	96.3	39,646	108.9
226	Karstula	46,080	104.7	24,724	83.3	70,804	97.2	46,380	104.4	27,726	75.8	74,106	93.7
249	Keuruu	81,476	115.0	25,971	95.3	107,448	110.2	81,827	114.6	28,034	89.6	109,861	108.3
256	Kinnula	24,135	87.0	13,708	82.0	37,842	85.2	24,436	86.6	15,901	72.5	40,337	81.0
265	Kivijärvi	29,831	102.3	11,434	89.5	41,265	98.8	30,109	101.9	12,890	80.9	42,998	95.6
275	Konnevesi	36,777	132.7	6,880	107.0	43,657	128.7	36,811	132.5	7,090	104.7	43,901	128.0
277	Korpilahti	45,442	135.7	6,436	117.8	51,878	133.5	45,635	135.3	6,575	116.1	52,210	132.9
291	Kuhmoinen	49,121	139.0	7,782	125.7	56,902	137.2	49,514	138.2	8,055	122.4	57,569	136.0
312	Kyyjärvi	18,404	90.9	13,612	72.3	32,016	83.0	18,682	90.2	17,047	60.2	35,729	75.9
410	Laukaa	41,987	135.3	7,321	114.4	49,309	132.2	42,119	134.9	7,486	112.5	49,605	131.5
415	Leivonmäki	22,613	140.6	9,014	110.9	31,627	132.1	22,652	140.3	9,753	104.3	32,405	129.5
435	Luhanka	15,764	135.7	2,225	116.8	17,989	133.3	15,834	135.3	2,268	115.2	18,102	132.7
495	Multia	44,005	111.3	19,562	87.9	63,567	104.1	44,184	111.1	21,346	81.9	65,529	101.6
500	Muurame	10,384	131.9	1,230	117.5	11,614	130.4	10,421	131.4	1,254	116.1	11,674	129.8
592	Petäjävesi	31,238	123.8	7,884	103.5	39,121	119.7	31,256	123.6	8,280	100.0	39,536	118.7
601	Pihlajpudas	60,668	103.6	27,720	93.7	88,388	100.5	61,195	103.2	30,597	86.2	91,792	97.5
633	Pykkönmäki	20,280	106.1	9,656	87.1	29,935	100.0	20,367	105.9	10,684	80.3	31,051	97.1
729	Saarjärvi	58,049	122.1	15,580	100.8	73,629	117.6	58,155	122.0	16,309	97.4	74,464	116.6
850	Toivakka	25,505	135.2	4,860	117.3	30,365	132.4	25,566	134.9	4,985	115.1	30,551	131.7
892	Uurainen	22,837	126.6	6,704	101.6	29,541	120.9	22,897	126.4	7,056	97.9	29,953	119.7
931	Viitasaari	85,019	115.0	21,782	105.8	106,801	113.1	85,409	114.7	22,710	102.3	108,119	112.1
992	Äänekoski	59,621	129.7	13,396	109.1	73,017	125.8	59,851	129.3	13,892	106.5	73,743	125.0
Total		1,077,074	123.7	307,957	99.9	1,385,031	118.4	1,081,996	123.3	332,244	93.8	1,414,240	116.4
<b>Pohjois-Savo</b>													
<i>Municipality</i>													
140	Iisalmi	42,576	113.2	13,737	105.5	56,313	111.3	42,611	113.1	14,197	102.8	56,807	110.5
174	Juankoski	30,058	126.4	6,495	110.8	36,552	123.7	30,084	126.4	6,788	106.8	36,872	122.7
204	Kaavi	46,220	131.3	12,179	108.1	58,399	126.5	46,415	131.0	12,693	104.4	59,107	125.3



227	Kaarttula	31,836	131.0	8,337	109.4	40,174	126.5	31,836	131.0	8,579	106.5	40,415	125.8
239	Keitele	28,142	116.2	11,987	103.4	40,129	112.4	28,166	116.1	12,612	99.2	40,777	110.9
263	Kiuruvesi	59,569	99.4	40,477	89.7	100,047	95.5	59,585	99.4	42,710	86.0	102,295	93.8
297	Kuopio	78,422	138.6	13,072	120.0	91,494	135.9	78,460	138.4	13,385	117.6	91,845	135.4
402	Lapinlahti	33,917	122.2	12,909	106.3	46,826	117.8	33,933	122.2	13,384	103.2	47,317	116.8
420	Leppävirta	81,459	148.6	14,413	125.0	95,872	145.0	81,459	148.6	14,707	121.5	96,166	144.4
476	Maaninka	27,237	135.5	7,540	116.5	34,778	131.4	27,257	135.4	7,716	114.3	34,972	130.7
534	Nilsiä	44,518	127.6	11,621	108.3	56,139	123.6	44,547	127.5	12,219	103.8	56,766	122.4
595	Pielavesi	65,382	118.1	29,227	103.5	94,608	113.6	65,495	118.0	30,623	99.5	96,118	112.1
686	Rautalammi	37,931	127.3	7,035	105.8	44,966	124.0	37,931	127.3	7,256	102.6	45,187	123.3
687	Rautavaara	57,747	103.6	37,534	89.4	95,281	98.0	57,823	103.5	42,477	80.9	100,300	93.9
749	Siilinjärvi	23,117	124.9	4,866	109.4	27,982	122.2	23,127	124.8	4,968	107.5	28,095	121.8
762	Sonkajärvi	73,213	95.9	48,175	89.5	121,388	93.4	73,239	95.9	53,316	82.7	126,555	90.3
778	Suonenjoki	47,273	139.4	13,163	111.3	60,436	133.3	47,273	139.4	13,366	108.9	60,640	132.7
844	Tervo	23,879	125.7	5,159	106.3	29,038	122.3	23,879	125.7	5,268	103.6	29,147	121.7
857	Tuusniemi	38,987	124.9	6,729	112.7	45,716	123.1	39,085	124.7	6,909	110.2	45,994	122.5
915	Varkaus	26,285	140.4	5,483	127.6	31,767	138.1	26,285	140.4	5,622	124.9	31,907	137.6
916	Varpaisjärvi	27,377	118.9	11,215	104.4	38,593	114.7	27,403	118.8	11,785	100.2	39,189	113.2
921	Vesanto	28,575	121.7	6,323	109.3	34,898	119.4	28,575	121.7	6,482	106.0	35,057	118.8
925	Viermä	47,139	94.5	26,652	92.5	73,791	93.8	47,139	94.5	28,548	87.7	75,687	91.9
Total		1,000,856	122.2	354,329	101.4	1,355,185	116.8	1,001,605	122.1	375,611	96.5	1,377,216	115.1
<b>Pohjois-Karjala</b>													
<i>Municipality</i>													
45	Eno	58,828	109.6	23,146	85.3	81,974	102.7	59,063	109.2	25,140	80.4	84,203	100.6
146	Iloantasi	137,738	103.0	84,348	77.9	222,086	93.5	138,032	102.8	99,616	68.3	237,648	88.4
167	Joensuu	72,038	127.0	28,488	84.5	100,525	114.9	72,056	126.9	30,305	80.7	102,362	113.3
176	Juuka	86,222	108.5	43,429	92.8	129,651	103.2	86,349	108.3	47,618	85.6	133,967	100.3
248	Kesälahti	24,058	122.1	8,799	104.9	32,857	117.5	24,075	122.1	9,150	102.3	33,225	116.7
260	Kitee	50,393	132.1	19,889	95.5	70,282	121.8	50,399	132.1	20,572	93.1	70,970	120.8
276	Kontiolahti	46,850	124.5	19,839	101.6	66,689	117.7	46,938	124.3	20,698	98.5	67,636	116.4
309	Outokumpu	26,273	140.2	9,342	101.7	35,615	130.1	26,280	140.2	9,732	98.3	36,012	128.9
422	Lieksa	206,433	103.9	86,668	80.5	293,102	97.0	206,867	103.7	98,205	73.2	305,072	93.9

(continued)

Table 2b (continued)

	Forest land						Forest and poorly productive forest land						
	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	Mineral soil		Peatland		Total	(m <sup>3</sup> /ha)	
	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)		
426	Liperi	47,126	124.0	9,056	110.8	56,182	121.9	47,268	123.9	9,253	108.9	56,522	121.4
541	Nurmes	93,744	97.5	44,333	80.8	138,077	92.1	93,902	97.4	49,316	73.7	143,218	89.3
607	Polvijärvi	40,634	122.6	23,024	101.1	63,658	114.8	40,636	122.6	24,334	97.0	64,970	113.0
632	Pyhäselkä	15,532	121.0	5,668	118.1	21,200	120.2	15,532	121.0	5,859	114.9	21,392	119.3
707	Rääkkylä	24,211	132.7	10,031	122.9	34,242	129.8	24,227	132.6	10,533	118.0	34,760	128.1
848	Tohmajärvi	45,211	127.7	22,762	87.4	67,974	114.2	45,211	127.7	23,766	84.6	68,977	112.8
911	Valtimo	46,447	85.9	21,617	81.8	68,064	84.6	46,493	85.9	23,849	75.1	70,342	82.2
Total		1,021,739	112.1	460,439	87.6	1,482,179	104.5	1,023,329	111.9	507,947	80.9	1,531,276	101.6
<b>Kainuu</b>													
<i>Municipality</i>													
105	Hyrnsalmi	76,999	86.3	42,105	64.7	119,104	78.7	77,154	86.1	51,716	55.4	128,870	73.8
205	Kajaani	80,930	85.5	66,978	75.1	147,909	80.8	81,238	85.2	79,867	65.6	161,105	75.5
290	Kuhmo	258,362	91.6	148,267	70.2	406,629	83.8	258,753	91.5	179,619	60.4	438,371	78.7
578	Paltamo	50,934	89.8	28,939	78.1	79,873	85.6	51,032	89.7	32,130	71.9	83,162	82.8
620	Puolanka	131,830	79.7	69,268	61.0	201,099	73.2	132,162	79.5	91,488	49.7	223,649	67.3
697	Ristijärvi	49,315	86.8	23,422	71.3	72,737	81.8	49,395	86.7	27,096	63.7	76,491	78.5
765	Sotkamo	144,977	91.1	83,952	74.7	228,929	85.1	145,446	90.8	94,621	67.9	240,067	81.8
777	Suomussalmi	286,672	79.6	136,504	57.1	423,176	72.4	287,754	79.3	184,924	46.3	472,678	66.4
785	Vaala	44,580	79.0	46,615	68.8	91,195	73.8	44,959	78.3	61,913	56.0	106,872	65.4
Total		1,124,602	85.5	646,049	67.5	1,770,651	78.9	1,127,893	85.3	803,374	57.2	1,931,267	73.6
<b>Pohjois-Pohjanmaa</b>													
<i>Municipality</i>													
9	Alavieska	9,858	90.1	6,149	85.4	16,007	88.3	9,976	89.4	7,059	76.5	17,035	84.0
69	Haapajärvi	31,834	101.3	25,934	94.4	57,768	98.2	31,896	101.1	29,363	85.2	61,259	93.5
71	Haapavesi	31,971	98.8	42,868	95.4	74,839	96.9	32,050	98.7	48,778	85.9	80,829	91.0
72	Hailuoto	9,249	84.0	4,701	61.4	13,950	76.4	9,538	81.8	5,554	54.3	15,092	71.7
84	Haukipudas	19,089	87.6	11,401	71.9	30,489	81.7	19,292	86.9	14,180	61.0	33,472	75.9
139	Ii	54,302	85.6	53,507	73.7	107,809	79.7	54,896	84.9	65,712	63.0	120,608	73.0

208	Kalajoki	26,385	76.4	20,540	81.8	46,925	78.7	27,348	74.8	23,261	74.1	50,609	74.4
244	Kempele	3,147	85.6	3,902	72.0	7,050	78.1	3,183	84.6	4,971	59.8	8,154	69.5
247	Kestliä	16,153	83.4	25,496	78.8	41,649	80.6	16,239	83.0	31,802	66.2	48,040	71.9
255	Kiiminki	13,260	95.5	10,038	74.6	23,298	86.5	13,354	95.0	12,401	63.5	25,755	79.8
305	Kuusamo	288,597	73.0	66,650	49.9	355,247	68.6	290,799	72.7	128,248	33.9	419,047	60.8
317	Kärsämäki	24,266	100.9	27,293	90.7	51,559	95.5	24,309	100.8	31,693	80.4	56,002	89.2
425	Liminka	11,946	77.5	24,050	70.8	35,995	73.0	12,053	76.8	31,998	57.0	44,051	62.4
436	Lumijoki	5,126	92.6	7,822	73.5	12,948	81.1	5,223	91.0	9,057	65.5	14,280	74.8
483	Merijärvi	10,018	99.7	7,680	91.8	17,698	96.3	10,133	98.9	8,327	85.9	18,460	93.1
494	Muhos	22,560	78.6	25,363	68.6	47,923	73.3	22,666	78.2	33,096	55.9	55,762	65.0
535	Nivala	19,549	98.0	10,799	96.9	30,348	97.6	19,590	97.9	11,792	90.0	31,382	94.9
563	Oulainen	24,794	88.5	19,954	92.2	44,748	90.2	24,910	88.2	22,297	84.2	47,206	86.3
564	Oulu	11,163	99.6	8,628	82.1	19,791	92.0	11,294	98.7	9,662	75.3	20,956	87.9
567	Oulunsalo	5,346	94.8	5,306	72.7	10,653	83.8	5,430	93.6	6,690	60.8	12,120	75.5
603	Piippola	14,186	89.1	20,885	84.7	35,071	86.5	14,236	88.9	24,266	75.0	38,501	80.2
615	Pudasjärvi	225,773	72.9	143,151	59.4	368,924	67.7	228,205	72.5	207,102	45.8	435,307	59.8
617	Pulkila	10,692	96.3	18,224	90.1	28,916	92.4	10,722	96.1	20,201	82.9	30,924	87.5
625	Pyhäjoki	22,567	83.7	19,161	84.6	41,729	84.1	23,056	82.6	21,161	78.2	44,216	80.5
626	Pyhäsalmi	56,357	91.9	47,871	86.9	104,227	89.6	56,737	91.7	53,553	79.4	110,290	85.7
630	Pyhäntä	24,875	93.2	34,777	77.1	59,652	83.8	25,009	92.9	42,689	65.5	67,698	75.6
678	Rahe	19,739	95.9	18,711	84.0	38,450	90.1	19,877	95.4	20,970	76.6	40,848	85.7
682	Rantsila	16,538	85.8	33,522	78.2	50,060	80.7	16,623	85.5	41,301	66.4	57,924	71.9
691	Reisjärvi	21,172	89.2	13,091	85.4	34,263	87.7	21,205	89.0	15,984	72.2	37,189	81.8
746	Sievi	31,314	85.9	21,844	77.5	53,158	82.5	31,646	85.3	29,022	61.5	60,668	73.9
748	Stiikaajoki	27,983	90.7	40,228	74.2	68,211	80.9	28,250	89.9	48,635	64.0	76,885	73.5
832	Tarvalkoski	146,416	76.2	35,816	54.2	182,232	71.9	149,661	75.7	61,035	39.2	210,696	65.2
859	Tyrnävä	9,547	69.6	16,582	71.6	26,129	70.8	9,603	89.2	21,866	58.0	31,469	61.4
889	Utajärvi	49,450	82.8	57,506	69.8	106,956	75.8	49,743	82.4	77,056	56.3	126,800	66.5
926	Vihanti	14,191	95.1	19,041	80.4	33,232	86.6	14,251	94.8	23,030	69.2	37,281	79.0
972	Yli-Ii	24,252	77.6	26,821	66.5	51,073	71.7	24,441	77.1	33,827	55.9	58,268	64.8
973	Ylikiminki	32,502	92.9	34,470	73.3	66,971	82.8	32,668	92.5	43,410	61.2	76,077	74.6
977	Ylivieska	23,870	86.2	16,635	87.7	40,505	86.8	23,940	86.0	19,210	77.9	43,151	82.4
Total		1,410,035	81.9	1,026,416	74.2	2,436,451	78.6	1,424,052	81.4	1,340,261	60.5	2,764,313	71.3

(continued)

Table 2b (continued)

	Forest land				Forest and poorly productive forest land							
	Mineral soil		Peatland		Mineral soil		Peatland		Total			
	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)	(ha)	(m <sup>3</sup> /ha)		
<b>Lapland</b>												
<i>Municipality</i>												
47 Enontekiö	89,382	55.9	4,951	37.0	94,334	54.9	239,135	33.0	30,122	21.1	269,257	31.7
148 Inari	693,174	65.3	18,942	36.0	712,116	64.5	992,289	52.3	129,826	23.0	1,122,115	48.9
240 Kemi	4,966	70.8	1,442	68.5	6,409	70.3	5,045	70.3	1,584	63.7	6,629	68.7
241 Kemnmaa	25,862	75.6	19,260	70.5	45,121	73.4	26,191	75.2	23,221	60.7	49,412	68.4
261 Kittilä	393,766	56.3	73,229	43.8	466,995	54.3	417,393	54.6	198,103	26.0	615,496	45.4
273 Kolari	128,443	65.3	45,234	49.9	173,677	61.3	130,325	64.8	89,518	35.9	219,843	53.1
320 Kemijärvi	198,482	61.7	53,878	53.1	252,360	59.9	200,808	61.4	107,848	34.4	308,655	52.0
498 Muonio	112,820	66.7	8,347	46.0	121,167	65.2	122,021	63.9	29,441	24.5	151,462	56.2
583 Pelkosenniemi	82,513	60.5	38,493	57.0	121,006	59.4	84,194	59.8	71,903	37.6	156,097	49.6
614 Posio	163,506	67.7	44,067	51.4	207,573	64.2	166,783	67.1	89,917	33.2	256,700	55.2
683 Ranua	130,798	55.9	70,336	51.3	201,135	54.3	132,397	55.3	139,650	32.9	272,047	43.8
698 Rovaniemi	411,786	61.3	148,006	52.2	559,792	58.9	416,328	60.9	252,066	38.3	668,394	52.3
732 Salla	303,247	63.4	78,670	57.6	381,918	62.2	330,704	60.6	163,181	36.0	493,885	52.4
742 Savukoski	382,285	59.3	57,666	51.9	439,951	58.4	415,702	57.7	142,801	31.2	558,504	50.9
751 Simo	47,590	73.1	42,261	70.2	89,850	71.7	48,127	72.5	64,350	51.6	112,478	60.5
758 Sodankylä	581,110	55.3	87,037	46.1	668,146	54.1	625,686	53.3	258,250	28.5	883,936	46.1
845 Tervola	58,526	71.0	50,879	65.9	109,404	68.6	58,915	70.8	73,124	51.2	132,038	59.9
851 Tornio	47,875	72.7	34,778	70.6	82,653	71.8	48,279	72.4	45,924	57.1	94,204	65.0
854 Pello	98,715	61.2	35,929	56.8	134,644	60.0	99,585	60.9	58,233	43.5	157,817	54.5
890 Utsjoki	5,961	53.4	337	62.3	6,297	53.9	109,683	15.3	1,915	21.3	111,598	15.4
976 Ylitornio	78,847	62.1	62,476	62.4	141,322	62.3	80,388	61.3	93,989	48.5	174,377	54.4
Total	4,039,654	61.4	976,217	54.4	5,015,871	60.0	4,749,978	55.5	2,064,966	35.0	6,814,945	49.3

Table 3a Dominant tree species on forest land (By forestry centres).

Åland	Open regene- ration site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
<i>Municipality</i>												
35 Brändö	1.2	34	38.8	1,125	7.4	213	15.8	460	36.9	1,070	100.0	2,901
43 Eckerö	0.9	52	73.0	4,025	14.0	771	9.3	514	2.8	152	100.0	5,515
60 Finström	0.2	13	68.4	4,329	16.4	1,039	11.3	717	3.7	233	100.0	6,330
62 Föglö	0.0	0	69.8	4,317	13.7	850	9.1	562	7.5	467	100.0	6,196
65 Geta	0.2	5	76.9	2,556	13.3	441	7.7	255	2.0	65	100.0	3,323
76 Hammarland	0.3	19	70.4	4,892	15.5	1,075	10.4	720	3.6	247	100.0	6,953
170 Jomala	0.4	33	68.5	5,170	16.7	1,258	10.6	803	3.8	288	100.0	7,551
295 Kumlinge	0.3	9	60.7	1,956	9.5	305	10.9	350	18.8	605	100.0	3,225
318 Kökar	–	–	37.9	494	8.0	104	23.8	310	30.3	395	100.0	1,304
417 Lemland	0.5	34	65.6	4,169	16.9	1,073	11.5	732	5.4	342	100.0	6,350
438 Lumparland	0.2	4	72.8	1,232	15.1	255	8.1	137	3.9	65	100.0	1,693
478 Mariehamn	1.1	5	66.2	304	13.0	60	14.0	64	5.7	26	100.0	459
736 Saltvik	0.2	14	75.4	4,696	15.3	956	6.5	405	2.6	159	100.0	6,231
766 Sottunga	0.2	1	59.1	517	10.2	89	12.9	112	17.6	154	100.0	874
771 Sund	0.2	13	71.7	3,698	15.7	807	8.7	449	3.7	190	100.0	5,157
941 Vårdö	0.3	11	73.2	2,732	13.1	490	7.7	288	5.6	211	100.0	3,732
Total	0.4	241	68.2	46,216	14.4	9,789	10.1	6,878	6.9	4,669	100.0	67,794
<b>Rannikko/Etelärannikko</b>												
<i>Municipality</i>												
40 Dragsfjärd	0.7	103	76.7	11,577	15.3	2,306	4.3	650	3.0	456	100.0	15,092
49 Espoo-Esbo	0.0	4	44.7	6,815	34.7	5,296	15.2	2,317	5.4	824	100.0	15,256
78 Hanko-Hangö	0.1	7	71.0	4,863	18.1	1,242	8.0	546	2.7	187	100.0	6,845
91 Helsingfors	0.6	36	37.6	2,452	30.3	1,980	24.1	1,573	7.4	485	100.0	6,526

(continued)

Table 3a (continued)

	Open regeneration site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
92	0.4	45	32.0	3,238	40.0	4,047	21.4	2,164	6.1	619	100.0	10,113
101	–	–	84.9	5,756	10.5	714	2.7	180	1.9	132	100.0	6,782
Houts kari												
149	1.3	229	54.9	9,541	32.2	5,588	11.0	1,907	0.6	106	100.0	17,372
150	–	–	81.4	3,005	11.7	433	3.2	119	3.7	135	100.0	3,692
220	1.5	170	52.5	5,926	31.3	3,540	12.4	1,396	2.3	262	100.0	11,293
235	–	–	48.8	98	28.9	58	18.3	37	4.0	8	100.0	201
Grankulla												
243	0.3	57	75.8	13,173	17.9	3,107	4.5	778	1.6	275	100.0	17,390
257	0.4	71	50.2	9,389	32.0	5,985	13.9	2,608	3.5	660	100.0	18,714
Kyrkslätt												
279	0.0	0	82.1	6,898	11.4	955	3.8	318	2.7	229	100.0	8,400
407	0.6	104	34.9	6,015	54.5	9,400	9.6	1,652	0.4	69	100.0	17,240
Lapträsk												
424	0.6	32	36.9	2,122	54.2	3,119	7.9	455	0.5	31	100.0	5,759
434	0.2	6	47.0	1,291	45.2	1,242	7.1	196	0.4	12	100.0	2,747
533	0.0	0	76.8	9,987	11.9	1,549	8.2	1,060	3.1	409	100.0	13,006
573	0.2	28	76.3	11,102	13.1	1,909	8.1	1,181	2.3	334	100.0	14,554
585	1.1	276	60.1	10,357	49.2	12,716	8.7	2,238	0.9	237	100.0	25,824
606	0.5	76	66.0	9,831	23.6	3,514	8.1	1,204	1.8	273	100.0	14,898
638	0.7	254	36.5	13,288	53.0	19,302	8.1	2,963	1.7	623	100.0	36,430
701	0.8	124	43.6	7,008	45.1	7,241	10.2	1,634	0.3	51	100.0	16,058
Strömfors												
753	0.9	175	35.7	6,995	49.8	9,749	11.3	2,218	2.3	454	100.0	19,591
755	0.5	60	44.3	5,504	40.4	5,012	12.2	1,516	2.6	319	100.0	12,412
835	0.3	132	67.8	29,678	24.2	10,602	5.7	2,496	2.0	860	100.0	43,767
Tammisaari												
923	0.4	23	76.8	4,378	16.8	958	4.5	259	1.5	84	100.0	5,701
Total	0.6	2,012	54.8	200,288	33.2	121,564	9.2	33,663	2.2	8,136	100.0	365,663

<b>Rannikko/Pohjanmaa</b>													
<i>Municipality</i>													
231	Kaskinen-Kaskö	0.5	3	49.5	320	35.6	230	9.8	63	4.6	29	100.0	646
272	Kokkola-Karleby	1.1	226	63.0	13,159	20.6	4,295	14.4	3,009	0.9	194	100.0	20,883
280	Korsnäs	1.6	277	57.2	9,958	29.3	5,108	10.8	1,882	1.1	197	100.0	17,422
287	Kristinestad-Kristiinankaupunki	0.6	289	57.6	27,378	35.3	16,767	5.9	2,795	0.6	279	100.0	47,508
288	Kronoby-Kruunupyö	0.9	442	71.8	35,056	16.5	8,055	10.4	5,052	0.4	205	100.0	48,811
440	Larsmo-Luoto	1.7	162	66.3	6,450	19.2	1,869	11.8	1,147	1.0	100	100.0	9,729
475	Malax-Maalathi	1.8	623	57.5	20,292	27.7	9,775	11.7	4,132	1.4	486	100.0	35,308
499	Korsholm-Mustasaari	1.1	571	46.2	24,922	39.5	21,332	10.5	5,689	2.7	1,436	100.0	53,950
545	Närpes-Närpiö	0.7	459	56.7	36,398	33.8	21,696	7.9	5,088	0.9	595	100.0	64,237
559	Oravais-Oravainen	2.3	295	60.0	7,593	25.0	3,167	11.8	1,492	0.9	110	100.0	12,657
598	Jakobstad-Pietarsaari	2.6	145	57.6	3,199	21.6	1,201	16.8	935	1.3	74	100.0	5,554
599	Pedersöre-Pedersören kunta	1.5	787	68.8	37,333	17.7	9,598	11.6	6,273	0.5	244	100.0	54,234
893	Nykarleby-Uusikaarlepy	2.3	1,110	64.0	31,290	20.3	9,913	12.8	6,262	0.6	278	100.0	48,853
905	Vaasa-Vasa	0.4	37	44.5	4,452	39.2	3,921	12.1	1,208	3.9	390	100.0	10,008
945	Vörå-Maximo-Vöyri	1.5	598	51.6	19,990	33.3	12,924	11.6	4,510	1.9	755	100.0	38,777
Total	Maksamaa	1.3	6,024	59.3	277,792	27.7	129,851	10.6	49,538	1.1	5,373	100.0	468,578

(continued)

Table 3a (continued)

	Open regener- ation site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
<b>Lounais-Suomi</b>												
<i>Municipality</i>												
6 Alastaro	1.9	229	53.4	6,376	37.6	4,491	6.3	750	0.7	83	100.0	11,929
17 Askainen	0.4	11	74.2	2,093	16.0	452	8.2	230	1.2	35	100.0	2,821
19 Aura	1.2	46	58.2	2,300	34.4	1,361	5.5	217	0.8	32	100.0	3,955
50 Eura	1.1	313	60.4	17,122	31.0	8,786	7.0	1,997	0.4	121	100.0	28,339
51 Eurajoki	1.4	311	58.6	12,661	31.2	6,734	8.0	1,728	0.8	180	100.0	21,612
73 Halikko	0.3	50	64.5	11,568	28.3	5,079	5.3	957	1.5	277	100.0	17,931
79 Harjavalta	1.9	133	59.5	4,240	31.3	2,230	7.1	504	0.2	17	100.0	7,124
99 Honkajoki	1.3	283	81.5	17,356	9.0	1,916	8.0	1,697	0.2	34	100.0	21,286
102 Huittinen	1.6	319	45.3	8,968	45.2	8,955	7.5	1,487	0.4	88	100.0	19,817
181 Jämijärvi	2.3	292	64.4	8,157	24.6	3,110	8.1	1,021	0.6	80	100.0	12,659
202 Kaarina	0.7	15	70.9	1,512	20.6	439	6.7	143	1.1	23	100.0	2,133
214 Kankaanpää	1.5	665	70.5	32,218	20.2	9,226	7.4	3,403	0.4	181	100.0	45,693
230 Karvia	1.5	474	82.9	26,595	9.0	2,899	6.4	2,059	0.2	60	100.0	32,087
252 Kiikala	1.3	189	56.7	7,955	35.2	4,946	5.7	803	1.0	143	100.0	14,036
254 Kiikoinen	1.6	151	53.4	4,898	36.2	3,319	8.3	759	0.6	52	100.0	9,179
259 Kisko	0.9	147	58.1	9,818	33.9	5,733	6.1	1,026	1.0	175	100.0	16,899
262 Kiukainen	1.2	82	53.8	3,652	35.5	2,411	8.9	604	0.7	44	100.0	6,792
271 Kokemäki	1.7	484	58.8	16,933	32.0	9,202	7.2	2,064	0.3	91	100.0	28,774
284 Koski Tl	1.8	143	42.7	3,399	48.8	3,884	5.7	456	0.9	72	100.0	7,954
304 Kustavi	0.3	26	77.6	7,041	11.9	1,083	7.7	695	2.5	231	100.0	9,075
308 Kuusjoki	0.9	43	51.3	2,396	41.9	1,954	4.7	220	1.2	55	100.0	4,667
319 Köyliö	2.1	308	61.4	9,040	29.9	4,406	6.3	929	0.3	45	100.0	14,728
400 Laitila	0.9	291	65.7	21,287	26.8	8,681	6.2	2,009	0.5	151	100.0	32,419
406 Lappi	1.1	150	65.9	8,819	26.2	3,509	6.2	831	0.5	68	100.0	13,377
413 Lavia	1.8	418	58.4	13,454	30.7	7,083	8.4	1,930	0.7	151	100.0	23,035



419	Lemu	1.1	20	73.3	1,316	17.5	314	7.6	137	0.5	9	100.0	1,796
423	Lieto	0.8	69	64.9	5,743	29.5	2,611	4.3	380	0.5	46	100.0	8,849
430	Loimaa	1.5	272	44.0	7,838	47.3	8,417	6.4	1,140	0.8	143	100.0	17,811
442	Luvia	1.5	174	46.2	5,491	43.0	5,111	8.6	1,018	0.8	89	100.0	11,884
480	Marttila	1.2	114	53.9	4,905	38.3	3,482	5.6	511	1.0	87	100.0	9,100
481	Masku	1.0	42	68.8	2,932	24.5	1,044	5.1	219	0.7	28	100.0	4,264
482	Mellilä	1.8	63	48.9	1,743	42.6	1,519	6.1	219	0.7	24	100.0	3,567
484	Merikarvia	1.9	614	63.1	20,474	27.7	9,000	6.8	2,221	0.4	135	100.0	32,445
485	Merimasku	0.1	4	78.2	2,077	13.3	352	6.4	169	2.0	54	100.0	2,657
501	Muurla	0.8	33	60.9	2,529	31.6	1,315	5.8	240	1.0	40	100.0	4,156
503	Mynämäki	1.4	428	63.7	19,915	28.0	8,752	6.5	2,035	0.4	112	100.0	31,242
529	Naantali	0.4	10	76.6	1,815	16.0	378	5.8	137	1.3	30	100.0	2,371
531	Nakkila	2.1	187	48.8	4,257	39.5	3,444	9.0	784	0.7	57	100.0	8,730
537	Noormarkku	1.7	412	52.4	12,790	37.1	9,055	8.5	2,077	0.4	87	100.0	24,421
538	Nousiainen	1.4	150	62.2	6,707	31.2	3,364	4.9	533	0.3	29	100.0	10,782
561	Oripää	1.6	87	64.5	3,586	27.2	1,513	6.2	345	0.5	26	100.0	5,558
577	Paimio	0.4	50	69.5	7,743	24.5	2,735	4.7	519	0.9	98	100.0	11,144
586	Pemiö	0.7	161	63.0	14,569	30.5	7,049	5.1	1,173	0.7	164	100.0	23,117
587	Pertteli	0.8	53	57.8	3,828	34.8	2,304	5.6	372	1.0	68	100.0	6,626
602	Piikkiö	0.5	18	70.2	2,677	23.7	902	4.9	186	0.8	29	100.0	3,813
608	Pomarkku	1.3	291	51.8	11,772	39.2	8,901	7.3	1,656	0.4	86	100.0	22,706
609	Pori	1.9	547	48.9	13,785	39.2	11,059	9.4	2,663	0.6	164	100.0	28,219
631	Pyhäranta	0.6	59	66.4	6,360	24.8	2,372	6.8	655	1.4	137	100.0	9,582
636	Pöytyä	1.3	266	57.0	11,697	35.3	7,253	5.6	1,149	0.8	161	100.0	20,526
680	Raisio	1.0	18	71.4	1,322	20.7	384	6.0	111	0.9	16	100.0	1,852
684	Rauma	0.7	123	67.4	12,075	24.3	4,358	6.5	1,165	1.0	182	100.0	17,904
704	Rusko	1.0	22	68.4	1,547	25.7	580	4.4	100	0.6	13	100.0	2,262
705	Rymättylä	0.3	18	79.6	5,704	13.1	936	5.3	377	1.8	128	100.0	7,163
734	Salo	0.7	54	60.9	4,508	30.9	2,284	6.5	484	1.0	73	100.0	7,403
738	Sauvo	0.8	101	72.1	8,611	21.1	2,523	5.1	604	0.9	108	100.0	11,946
747	Siikainen	1.9	628	65.1	22,082	24.8	8,409	7.6	2,586	0.7	224	100.0	33,928

(continued)

Table 3a (continued)

	Open regene- ration site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
761	1.2	382	46.3	15,374	44.0	14,581	7.2	2,397	1.3	440	100.0	33,174
776	1.4	155	55.9	6,104	34.3	3,752	7.1	778	1.3	137	100.0	10,927
783	1.9	179	64.5	6,222	28.4	2,742	4.9	472	0.3	30	100.0	9,646
784	0.4	23	64.3	3,415	29.0	1,540	4.9	259	1.4	76	100.0	5,314
833	0.3	17	77.9	4,843	13.5	842	6.9	427	1.4	87	100.0	6,217
838	0.9	40	56.0	2,438	36.5	1,591	5.5	239	1.1	50	100.0	4,357
853	1.0	87	69.7	6,132	21.4	1,886	6.9	608	1.0	90	100.0	8,802
886	2.0	545	54.9	15,021	34.0	9,304	8.7	2,373	0.4	121	100.0	27,364
895	1.3	376	75.0	21,297	16.8	4,768	6.2	1,773	0.7	197	100.0	28,411
906	1.3	55	60.9	2,544	32.0	1,338	5.4	225	0.3	14	100.0	4,177
913	1.7	114	46.1	3,102	44.6	3,004	7.1	476	0.5	37	100.0	6,733
918	0.8	72	75.6	6,931	16.9	1,548	6.2	568	0.5	48	100.0	9,167
920	0.2	3	81.9	1,379	9.9	166	5.4	92	2.7	45	100.0	1,684
979	1.2	280	63.3	15,039	29.7	7,048	5.5	1,317	0.3	79	100.0	23,763
Total	1.3	12,984	61.7	602,098	29.5	287,718	6.8	66,492	0.7	6,586	100.0	975,878
<b>Häme-Uusimaa</b>												
<i>Municipality</i>												
15	0.2	14	39.6	3,746	48.7	4,603	9.6	910	1.9	181	100.0	9,454
16	0.4	157	32.6	14,023	50.5	21,708	14.1	6,054	2.5	1,059	100.0	43,000
18	1.3	164	32.8	3,985	56.2	6,836	8.3	1,011	1.4	164	100.0	12,160
61	0.9	129	39.0	5,360	53.0	7,286	7.0	966	0.1	11	100.0	13,752
81	0.2	109	34.0	14,929	47.9	21,029	15.1	6,657	2.7	1,195	100.0	43,942
82	1.4	356	42.8	10,826	44.6	11,302	10.8	2,730	0.4	107	100.0	25,321
83	1.5	371	28.5	7,013	59.1	14,537	8.3	2,029	2.6	627	100.0	24,577
86	1.3	255	34.5	6,922	54.6	10,950	8.3	1,671	1.3	269	100.0	20,066
98	1.1	328	31.6	9,395	54.1	16,061	10.8	3,218	2.4	712	100.0	29,714
103	1.3	91	43.4	3,117	46.7	3,355	8.7	622	–	–	100.0	7,185

106	Hyvinkää	1.0	189	39.7	7,721	48.9	9,516	8.9	1,735	1.4	280	100.0	19,441
109	Hämeenlinna	1.1	122	34.9	3,751	49.1	5,266	12.6	1,347	2.3	246	100.0	10,732
111	Heinola	0.2	116	49.9	28,365	37.7	21,411	10.8	6,169	1.4	801	100.0	56,862
165	Janakkala	1.6	552	32.0	10,747	55.4	18,597	9.6	3,232	1.4	465	100.0	33,594
169	Jokioinen	1.3	104	40.6	3,258	50.7	4,067	7.1	569	0.3	24	100.0	8,022
186	Järvenpää	1.5	23	25.7	384	53.8	805	15.5	232	3.5	52	100.0	1,497
210	Kalvola	1.0	230	43.0	9,593	46.8	10,438	9.2	2,050	0.0	7	100.0	22,318
223	Karjalohja	2.0	155	54.0	4,111	31.6	2,405	10.7	814	1.7	127	100.0	7,612
224	Karkkila	0.5	88	43.0	6,972	47.3	7,663	8.4	1,362	0.7	119	100.0	16,205
245	Kerava	0.4	6	28.7	419	50.2	732	17.9	261	2.8	42	100.0	1,459
283	Hämeenkoski	1.2	145	25.4	3,024	62.3	7,432	9.2	1,093	2.0	233	100.0	11,927
316	Kärkölä	1.1	150	30.9	4,198	56.7	7,718	9.7	1,321	1.6	219	100.0	13,607
398	Lahti	0.2	19	31.9	2,529	46.2	3,657	15.4	1,219	6.3	498	100.0	7,922
401	Lammi	1.3	496	28.7	11,264	59.6	23,398	8.8	3,465	1.6	622	100.0	39,244
433	Loppi	0.8	334	41.5	17,227	49.5	20,574	7.8	3,251	0.4	173	100.0	41,559
444	Lohja-Lojo	0.8	125	44.8	7,250	37.2	6,014	13.5	2,188	3.7	607	100.0	16,183
504	Myrskylä-	0.7	88	35.8	4,428	52.1	6,443	10.0	1,239	1.4	168	100.0	12,366
	Mörskom												
505	Mäntsälä	1.2	395	31.4	10,475	58.4	19,455	8.0	2,678	1.0	330	100.0	33,332
532	Nastola	0.7	151	43.2	9,787	38.8	8,803	13.9	3,158	3.4	774	100.0	22,673
540	Nummi-	0.9	270	49.3	14,567	38.2	11,300	10.8	3,202	0.7	220	100.0	29,559
	Pusula												
543	Nurmijärvi	0.3	47	35.8	6,378	47.3	8,430	13.5	2,415	3.2	566	100.0	17,836
560	Orimattila	0.7	235	38.9	13,545	47.5	16,538	10.5	3,645	2.4	840	100.0	34,803
576	Padasjoki	0.5	241	34.6	15,381	53.4	23,729	10.2	4,542	1.2	527	100.0	44,419
611	Pornainen	1.6	137	30.6	2,610	54.5	4,645	11.7	997	1.6	133	100.0	8,523
616	Pukkila	1.2	90	32.1	2,396	52.8	3,942	12.2	913	1.6	122	100.0	7,463
692	Renko	0.6	109	44.0	8,311	48.2	9,094	7.0	1,325	0.2	40	100.0	18,879
694	Riihimäki	1.0	64	33.3	2,237	54.3	3,647	9.9	664	1.6	108	100.0	6,719
737	Sammatti	2.2	101	52.3	2,339	31.1	1,391	12.8	574	1.6	71	100.0	4,475
781	Sysmä	0.4	205	34.6	18,057	47.5	24,817	15.0	7,825	2.5	1,330	100.0	52,235

(continued)

Table 3a (continued)

	Open regene- ration site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
834	0.5	215	47.7	20,892	44.1	19,314	7.7	3,356	–	–	100.0	43,777
855	1.8	214	27.5	3,299	60.2	7,221	8.9	1,070	1.6	193	100.0	11,998
858	0.8	88	29.9	3,157	52.7	5,563	13.6	1,430	3.0	316	100.0	10,554
927	0.2	61	42.8	13,713	42.3	13,549	11.6	3,710	3.0	976	100.0	32,009
981	0.8	62	43.8	3,473	47.0	3,726	8.0	635	0.4	29	100.0	7,925
Total	0.8	7,601	37.9	355,195	49.0	458,965	10.6	99,555	1.7	15,583	100.0	936,899
<b>Kaakois-Suomi</b>												
<i>Municipality</i>												
44	1.3	243	38.5	7,483	50.6	9,844	8.9	1,730	0.7	140	100.0	19,440
75	1.1	485	61.6	26,956	32.0	13,999	5.0	2,177	0.3	153	100.0	43,769
142	1.0	404	45.7	18,049	42.9	16,920	9.4	3,721	0.9	367	100.0	39,462
153	1.6	156	43.8	4,186	39.2	3,746	13.6	1,297	1.9	180	100.0	9,564
163	0.5	169	63.2	21,994	26.5	9,211	8.6	3,007	1.1	395	100.0	34,776
173	1.6	315	45.2	9,104	38.7	7,788	12.8	2,578	1.8	362	100.0	20,147
285	1.2	217	54.8	9,827	33.3	5,966	9.6	1,718	1.1	203	100.0	17,930
286	1.4	30	48.4	1,027	35.4	750	13.4	285	1.4	29	100.0	2,121
306	0.9	61	49.8	3,408	36.5	2,496	11.7	804	1.1	77	100.0	6,847
405	1.2	638	54.5	29,246	36.2	19,453	7.2	3,884	0.9	487	100.0	53,707
416	0.9	144	52.6	8,327	34.5	5,456	10.4	1,650	1.6	248	100.0	15,824
441	0.8	471	63.1	37,097	30.8	18,110	4.9	2,861	0.4	226	100.0	58,765
489	0.9	287	65.7	20,897	29.0	9,230	4.1	1,288	0.3	84	100.0	31,786
580	1.4	597	48.3	20,300	33.9	14,269	14.8	6,241	1.5	626	100.0	42,033
624	1.0	204	50.6	10,297	39.0	7,924	8.6	1,745	0.8	160	100.0	20,329
689	1.4	381	47.7	13,365	36.0	10,073	13.2	3,707	1.7	478	100.0	28,004
700	1.0	756	60.3	47,503	27.8	21,938	10.0	7,885	0.9	703	100.0	78,786
739	0.4	175	66.9	27,994	24.0	10,051	7.6	3,158	1.1	441	100.0	41,818

754	Anjalankoski	1.0	461	58.6	28,178	34.7	16,661	5.3	2,566	0.4	193	100.0	48,060
775	Suomenniememi	0.9	224	74.4	18,046	17.0	4,132	6.9	1,664	0.8	188	100.0	24,254
831	Taipalsaari	0.9	237	60.7	16,758	25.1	6,932	11.9	3,286	1.5	408	100.0	27,621
909	Valkeala	0.7	447	63.8	40,551	29.1	18,461	5.8	3,715	0.5	344	100.0	63,518
935	Viirolahti	1.4	383	67.6	17,858	26.0	6,865	4.6	1,207	0.4	96	100.0	26,409
978	Ylämaa	1.0	303	66.0	20,081	28.5	8,681	4.3	1,298	0.3	78	100.0	30,442
Total		1.0	7,787	58.4	458,531	31.7	248,955	8.1	63,471	0.8	6,666	100.0	785,412
<b>Pirkanmaa</b>													
<i>Municipality</i>													
20	Akaa	1.4	78	40.8	2,245	44.2	2,432	12.6	693	0.9	51	100.0	5,498
108	Hämeenkyrö	0.9	271	42.0	13,339	44.7	14,191	11.9	3,768	0.7	208	100.0	31,776
143	Ikaalinen	1.4	799	58.8	32,706	31.8	17,716	7.6	4,250	0.3	179	100.0	55,650
177	Juupajoki	1.3	252	46.1	9,277	43.9	8,840	8.2	1,659	0.4	90	100.0	20,120
211	Kangasala	1.0	356	42.6	14,971	44.0	15,483	11.5	4,048	0.9	308	100.0	35,165
250	Kihniö	0.7	195	80.1	21,574	13.2	3,562	5.8	1,575	0.2	43	100.0	26,950
289	Kuhmalahti	0.9	121	38.4	4,983	48.9	6,348	10.8	1,403	0.9	115	100.0	12,971
303	Kuru	0.8	501	64.7	38,371	29.1	17,267	5.2	3,086	0.1	83	100.0	59,309
310	Kylmäkoski	1.2	136	45.3	5,272	44.5	5,183	8.3	968	0.7	78	100.0	11,637
418	Lempäälä	0.9	174	36.0	6,811	51.7	9,778	10.7	2,014	0.7	125	100.0	18,902
493	Mouhijärvi	1.0	178	47.6	8,460	42.4	7,540	8.6	1,531	0.4	78	100.0	17,786
506	Mänttä	0.6	26	43.2	1,996	43.8	2,020	11.9	550	0.6	26	100.0	4,617
536	Nokia	0.9	195	43.1	8,926	45.6	9,444	9.9	2,048	0.5	112	100.0	20,725
562	Orivesi	1.0	651	44.2	27,456	46.2	28,697	8.1	5,046	0.5	329	100.0	62,179
581	Parkano	1.2	741	77.1	48,721	16.2	10,245	5.3	3,363	0.2	107	100.0	63,177
604	Pirkkala	1.0	55	36.1	1,973	49.6	2,712	12.5	682	0.8	43	100.0	5,466
619	Punkalaidun	1.5	288	43.4	8,199	49.3	9,322	5.3	993	0.6	110	100.0	18,914
635	Pälkäne	0.6	240	35.8	15,004	51.7	21,688	10.9	4,574	1.1	453	100.0	41,958
702	Ruovesi	1.0	608	51.9	32,185	40.7	25,206	6.2	3,814	0.3	189	100.0	62,002
837	Tampere	0.9	337	41.5	15,440	47.5	17,664	9.6	3,569	0.5	178	100.0	37,188
887	Urijala	1.0	318	44.2	13,755	45.2	14,057	8.8	2,743	0.7	226	100.0	31,101
908	Valkeakoski	1.0	166	35.9	6,277	48.9	8,538	13.0	2,275	1.2	212	100.0	17,468

(continued)

Table 3a (continued)

	Open regeneration site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
912	1.2	665	49.5	27,858	40.7	22,892	8.2	4,615	0.4	238	100.0	56,268
922	1.3	275	40.1	8,602	50.9	10,907	7.2	1,547	0.5	104	100.0	21,435
933	1.1	410	49.3	18,749	40.9	15,571	8.3	3,153	0.4	153	100.0	38,037
936	1.1	976	71.3	65,068	22.0	20,069	5.4	4,908	0.2	227	100.0	91,247
980	1.1	329	43.8	12,748	44.0	12,792	10.6	3,073	0.5	150	100.0	29,092
988	1.7	275	54.6	8,814	36.2	5,839	7.2	1,170	0.3	50	100.0	16,149
Total	1.1	9,617	52.6	479,783	37.9	346,005	8.0	73,119	0.5	4,264	100.0	912,787
<b>Etelä-Savo</b>												
<i>Municipality</i>												
46	1.8	515	45.5	13,000	36.6	10,449	14.8	4,230	1.3	362	100.0	28,556
90	1.1	1,045	44.3	41,999	42.5	40,357	10.9	10,341	1.2	1,109	100.0	94,851
97	1.1	451	50.9	20,437	30.6	12,280	15.7	6,319	1.6	635	100.0	40,121
171	1.6	722	47.5	21,843	39.4	18,130	10.5	4,818	1.0	459	100.0	45,972
178	1.6	1,573	51.5	50,822	35.0	34,597	11.0	10,823	0.9	937	100.0	98,751
213	1.8	1,665	52.6	48,031	33.3	30,391	11.3	10,342	1.0	909	100.0	91,338
246	1.8	870	52.1	25,791	30.2	14,960	14.7	7,284	1.2	590	100.0	49,494
491	1.6	2,208	48.2	68,336	33.9	47,996	14.8	21,026	1.6	2,204	100.0	141,769
507	1.5	1,242	60.5	51,189	24.3	20,601	12.4	10,454	1.4	1,147	100.0	84,632
588	1.2	392	40.3	12,881	37.9	12,122	19.6	6,257	0.9	302	100.0	31,954
593	1.6	2,196	55.3	74,001	32.1	42,934	10.4	13,889	0.6	859	100.0	133,880
618	1.9	825	54.6	23,506	30.2	13,016	12.1	5,214	1.2	504	100.0	43,065
623	0.9	670	73.3	52,039	14.8	10,544	10.3	7,281	0.7	502	100.0	71,036
681	1.8	844	45.1	20,836	36.4	16,826	15.0	6,923	1.6	749	100.0	46,178
696	1.3	645	56.6	27,468	27.4	13,315	13.4	6,498	1.3	620	100.0	48,545
740	1.3	887	56.4	39,859	26.9	18,975	14.1	9,984	1.3	937	100.0	70,641
741	1.8	616	45.4	15,757	38.0	13,205	13.7	4,765	1.1	368	100.0	34,710
768	1.6	824	59.4	30,175	26.9	13,662	11.1	5,631	1.0	485	100.0	50,778
Total	1.5	18,189	52.9	637,969	31.9	384,359	12.6	152,078	1.1	13,677	100.0	1,206,273

**Etelä-Pohjanmaa***Municipality*

4	Alahärmä	2.1	395	81.0	15,292	10.0	1,883	6.4	1,204	0.5	94	100.0	18,868
5	Alajärvi	1.1	566	85.5	43,485	7.4	3,766	5.9	2,996	0.1	35	100.0	50,848
10	Alavus	1.2	627	85.1	45,262	8.7	4,613	4.9	2,599	0.1	67	100.0	53,169
52	Evijärvi	1.4	346	79.2	19,613	12.5	3,108	6.6	1,627	0.3	82	100.0	24,776
74	Halsua	0.4	116	89.7	24,758	4.4	1,226	4.8	1,319	0.7	196	100.0	27,614
95	Himanka	0.6	98	76.3	12,694	12.0	1,995	10.5	1,750	0.7	108	100.0	16,645
145	Ilmajoki	2.3	815	65.8	22,927	27.2	9,487	4.5	1,583	0.1	47	100.0	34,858
151	Isojoki	0.7	323	72.0	33,690	20.3	9,485	6.9	3,208	0.1	66	100.0	46,773
152	Isokyrö	2.1	401	65.4	12,456	23.6	4,492	8.1	1,540	0.9	172	100.0	19,061
164	Jalasjärvi	1.3	656	81.4	41,127	12.4	6,253	4.8	2,415	0.2	78	100.0	50,529
175	Jurva	1.2	372	64.5	20,138	27.7	8,654	6.2	1,923	0.4	134	100.0	31,221
217	Kannus	0.7	202	78.1	22,097	8.9	2,518	11.7	3,320	0.6	157	100.0	28,294
218	Karjoki	1.3	155	69.5	8,408	22.8	2,763	6.2	748	0.2	24	100.0	12,098
232	Kauhajoki	1.2	1,013	83.8	69,259	11.0	9,108	3.8	3,157	0.1	107	100.0	82,645
233	Kauhava	1.5	429	81.5	23,225	10.8	3,080	6.0	1,705	0.2	62	100.0	28,501
236	Kaustinen	0.7	174	84.0	19,481	7.1	1,637	8.0	1,855	0.2	53	100.0	23,201
281	Kortesjärvi	1.6	349	82.7	18,375	9.5	2,119	5.9	1,310	0.2	53	100.0	22,206
300	Kuortane	1.3	412	82.6	26,092	12.1	3,830	3.9	1,231	0.1	22	100.0	31,586
301	Kurikka	2.6	699	73.6	20,080	19.8	5,400	3.9	1,073	0.1	28	100.0	27,280
315	Kälviä	0.6	290	79.4	35,793	10.4	4,678	9.1	4,116	0.5	208	100.0	45,085
399	Laihia	1.7	543	59.5	19,393	28.2	9,200	9.9	3,227	0.7	233	100.0	32,596
403	Lappajärvi	1.2	345	79.8	22,957	11.0	3,177	7.8	2,246	0.2	45	100.0	28,770
408	Lapua	1.3	535	76.3	32,625	15.8	6,768	6.3	2,692	0.3	136	100.0	42,756
414	Lehtimäki	1.1	190	84.4	15,255	8.6	1,560	5.9	1,061	0.0	4	100.0	18,070
421	Lestijärvi	0.9	299	84.7	28,131	8.3	2,757	5.6	1,859	0.5	157	100.0	33,203
429	Lohtaja	1.3	374	79.4	22,945	10.1	2,919	8.7	2,518	0.5	148	100.0	28,904
544	Nurmo	1.8	425	79.1	18,340	14.0	3,236	4.9	1,142	0.2	43	100.0	23,187
584	Perho	0.2	103	92.0	48,742	4.5	2,371	2.8	1,503	0.5	279	100.0	52,997

(continued)

Table 3a (continued)

	Open regeneration site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
743	1.6	561	82.6	28,662	9.3	3,237	6.3	2,176	0.2	58	100.0	34,695
759	1.0	402	83.1	33,726	10.1	4,115	5.7	2,303	0.1	24	100.0	40,570
846	1.4	486	69.7	25,024	24.0	8,608	4.8	1,712	0.1	48	100.0	35,878
849	0.7	263	80.5	29,069	10.0	3,615	8.0	2,893	0.8	291	100.0	36,130
863	1.4	294	83.3	17,765	11.8	2,515	3.4	731	0.0	9	100.0	21,314
885	0.6	70	83.6	8,983	7.9	852	7.2	769	0.6	65	100.0	10,740
924	1.0	312	82.0	26,893	9.8	3,210	6.8	2,231	0.4	144	100.0	32,791
934	1.2	235	82.5	15,577	9.0	1,700	7.0	1,324	0.2	34	100.0	18,871
942	1.8	159	46.2	4,111	33.4	2,975	15.3	1,357	3.3	296	100.0	8,897
971	1.8	125	72.5	4,948	16.8	1,148	8.1	555	0.7	45	100.0	6,822
975	2.5	697	68.9	19,152	22.3	6,198	6.1	1,702	0.2	56	100.0	27,805
989	1.2	748	79.3	50,777	14.7	9,408	4.6	2,934	0.2	127	100.0	63,995
Total	1.2	15,604	79.1	1,007,330	13.3	169,662	6.1	77,616	0.3	4,035	100.0	1,274,246
<b>Keski-Suomi</b>												
<i>Municipality</i>												
77	2.0	913	41.9	19,321	44.6	20,562	10.5	4,843	1.1	493	100.0	46,133
172	1.3	511	36.8	14,970	46.8	19,055	13.4	5,446	1.7	703	100.0	40,684
179	1.2	82	43.0	3,038	43.0	3,039	11.2	791	1.6	111	100.0	7,060
180	1.9	660	45.7	16,243	41.8	14,834	9.6	3,417	1.0	357	100.0	35,511
182	1.5	1,404	47.2	45,205	42.3	40,520	8.5	8,149	0.6	555	100.0	95,834
183	1.7	569	52.9	18,019	36.6	12,445	8.3	2,820	0.5	185	100.0	34,037
216	1.7	662	67.9	26,507	23.9	9,348	6.1	2,398	0.4	142	100.0	39,056
226	1.2	862	75.7	53,589	16.9	11,942	6.0	4,257	0.2	155	100.0	70,804
249	1.7	1,854	66.7	71,648	25.6	27,486	5.8	6,268	0.2	191	100.0	107,448
256	1.7	637	75.5	28,563	15.6	5,886	6.9	2,604	0.4	153	100.0	37,842
265	1.8	723	74.0	30,553	18.8	7,739	5.1	2,122	0.3	129	100.0	41,265



275	Konnevesi	2.3	982	45.9	20,038	41.3	18,046	9.7	4,229	0.8	362	100.0	43,657
277	Korpilahti	1.7	868	44.2	22,943	43.1	22,349	10.2	5,274	0.9	445	100.0	51,878
291	Kuhmoinen	1.3	719	47.0	26,749	43.4	24,708	7.6	4,315	0.7	411	100.0	56,902
312	Kyyjärvi	1.2	393	82.8	26,494	11.1	3,539	4.7	1,509	0.3	81	100.0	32,016
410	Laukaa	2.4	1,178	46.5	22,927	40.7	20,068	9.5	4,679	0.9	457	100.0	49,309
415	Leivonmäki	2.1	660	51.9	16,414	37.5	11,861	7.8	2,476	0.7	217	100.0	31,627
435	Luhanka	1.5	277	41.8	7,524	42.7	7,690	12.5	2,256	1.3	243	100.0	17,989
495	Multia	2.0	1,258	70.4	44,769	21.3	13,510	6.2	3,915	0.2	115	100.0	63,567
500	Muurame	1.7	192	42.5	4,931	44.0	5,115	10.7	1,246	1.1	130	100.0	11,614
592	Petäjävesi	2.0	777	54.4	21,278	34.8	13,609	8.4	3,269	0.5	189	100.0	39,121
601	Pihripudas	1.2	1,061	70.3	62,180	21.3	18,792	6.6	5,867	0.6	488	100.0	88,388
633	Pylkönmäki	2.0	612	72.0	21,551	19.4	5,795	6.5	1,936	0.1	42	100.0	29,935
729	Saarjärvi	1.8	1,337	60.3	44,400	29.6	21,775	7.9	5,845	0.4	272	100.0	73,629
850	Toivakka	2.1	624	47.3	14,369	39.8	12,084	9.8	2,967	1.1	321	100.0	30,365
892	Urainen	2.3	688	57.5	16,988	32.5	9,590	7.3	2,149	0.4	126	100.0	29,541
931	Virtasaari	1.7	1,812	57.7	61,574	31.1	33,227	8.9	9,503	0.6	684	100.0	106,801
992	Äänekoski	2.0	1,426	55.8	40,708	33.8	24,698	7.9	5,754	0.6	431	100.0	73,017
Total		1.7	23,740	58.0	803,494	31.7	439,309	8.0	110,301	0.6	8,188	100.0	1,385,031
<b>Pohjois-Savo</b>													
<i>Municipality</i>													
140	Isalmi	2.4	1,351	47.2	26,572	35.9	20,224	13.5	7,607	1.0	558	100.0	56,313
174	Juankoski	2.0	715	42.3	15,470	43.1	15,743	11.4	4,154	1.3	471	100.0	36,552
204	Kaavi	1.5	870	50.3	29,400	39.0	22,786	8.1	4,741	1.0	602	100.0	58,399
227	Karttula	1.5	600	42.2	16,954	42.2	16,950	12.7	5,097	1.4	573	100.0	40,174
239	Keitele	1.7	696	57.3	22,990	30.9	12,386	9.5	3,815	0.6	242	100.0	40,129
263	Kiuruvesi	1.2	1,242	60.7	60,685	23.8	23,809	13.6	13,586	0.7	725	100.0	100,047
297	Kuopio	1.5	1,397	37.0	33,846	47.5	43,498	12.2	11,188	1.7	1,566	100.0	91,494
402	Lapinlahti	1.8	850	46.8	21,898	38.1	17,861	12.2	5,710	1.1	506	100.0	46,826
420	Leppävirta	1.3	1,201	37.6	36,035	47.8	45,867	11.7	11,226	1.6	1,543	100.0	95,872
476	Maaninka	1.6	547	39.9	13,873	45.8	15,931	11.5	4,001	1.2	426	100.0	34,778

(continued)

Table 3a (continued)

	Open regeneration site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
534	2.0	1,105	42.6	23,941	42.0	23,560	12.2	6,843	1.2	690	100.0	56,139
595	1.7	1,577	52.5	49,632	33.9	32,102	11.0	10,389	1.0	908	100.0	94,608
686	2.1	949	45.7	20,564	38.7	17,406	12.3	5,518	1.2	529	100.0	44,966
687	2.2	2,092	65.7	62,630	22.4	21,342	9.2	8,732	0.5	487	100.0	95,281
749	2.1	588	36.1	10,102	46.4	12,976	13.8	3,870	1.6	445	100.0	27,982
762	2.4	2,872	64.6	78,477	22.2	27,007	10.3	12,503	0.4	529	100.0	121,388
778	2.2	1,324	44.8	27,063	42.0	25,360	10.1	6,127	0.9	563	100.0	60,436
844	1.7	488	43.9	12,755	41.3	11,992	12.0	3,474	1.1	329	100.0	29,038
857	1.6	736	39.0	17,837	45.6	20,843	12.0	5,478	1.8	822	100.0	45,716
915	2.6	826	44.0	13,982	40.4	12,840	11.7	3,712	1.3	407	100.0	31,767
916	2.2	852	48.3	18,630	36.4	14,059	12.0	4,626	1.1	426	100.0	38,593
921	1.8	629	49.7	17,336	37.2	12,971	10.5	3,678	0.8	285	100.0	34,898
925	1.8	1,312	63.0	46,495	22.6	16,669	12.2	9,013	0.4	302	100.0	73,791
Total	1.8	24,817	50.0	677,166	35.7	484,183	11.4	155,086	1.0	13,932	100.0	1,355,185
<b>Pohjois-Karjala</b>												
<i>Municipality</i>												
45	1.8	1,482	58.4	47,843	27.2	22,272	11.8	9,685	0.8	691	100.0	81,974
146	0.3	641	79.3	176,127	12.6	28,017	7.0	15,506	0.8	1,795	100.0	222,086
167	1.3	1,290	56.7	56,959	30.8	30,969	10.8	10,828	0.5	479	100.0	100,525
176	1.0	1,288	66.9	86,708	22.9	29,651	8.7	11,326	0.5	677	100.0	129,651
248	1.4	444	69.4	22,797	20.7	6,798	7.9	2,587	0.7	231	100.0	32,857
260	1.8	1,282	53.0	37,253	30.9	21,752	13.5	9,493	0.7	503	100.0	70,282
276	1.1	702	62.6	41,758	23.0	15,363	12.6	8,412	0.7	455	100.0	66,689
309	0.5	183	55.1	19,636	27.6	9,813	13.3	4,740	3.5	1,243	100.0	35,615
422	0.8	2,417	76.2	223,367	15.0	44,110	7.3	21,408	0.6	1,799	100.0	293,102

426	Liperi	1.2	701	48.3	27,140	35.2	19,783	14.0	7,872	1.2	686	100.0	56,182
541	Nurmes	1.2	1,649	65.5	90,470	23.0	31,741	9.2	12,663	1.1	1,555	100.0	138,077
607	Polvijärvi	1.0	653	57.9	36,834	25.4	16,193	13.9	8,846	1.8	1,133	100.0	63,658
632	Pyhäselkä	0.5	115	36.3	7,696	38.9	8,248	22.7	4,804	1.6	337	100.0	21,200
707	Rääkkylä	1.9	636	46.0	15,738	31.6	10,826	19.6	6,728	0.9	314	100.0	34,242
848	Tohmajärvi	1.4	948	59.4	40,408	30.2	20,542	8.6	5,878	0.3	197	100.0	67,974
911	Valtimo	0.8	560	65.3	44,426	22.3	15,205	10.2	6,965	1.3	909	100.0	68,064
Total		1.0	14,992	65.8	975,160	22.4	331,283	10.0	147,739	0.9	13,005	100.0	1,482,179
<b>Kainuu</b>													
<i>Municipality</i>													
105	Hyrnsalmi	0.7	879	77.3	92,056	14.7	17,540	7.0	8,377	0.2	252	100.0	119,104
205	Kajaani	0.8	1,220	81.0	119,769	7.5	11,052	10.3	15,292	0.4	575	100.0	147,909
290	Kuhmo	0.4	1,794	85.8	349,037	9.1	36,995	4.5	18,463	0.1	339	100.0	406,629
578	Paltamo	1.2	968	71.1	56,751	17.2	13,729	10.0	7,994	0.5	431	100.0	79,873
620	Puolanka	0.9	1,785	76.4	153,714	16.1	32,447	6.3	12,669	0.2	484	100.0	201,099
697	Ristijärvi	0.8	581	71.0	51,669	18.5	13,477	9.2	6,721	0.4	288	100.0	72,737
765	Sotkamo	0.9	2,110	71.5	163,737	17.6	40,282	9.3	21,235	0.7	1,565	100.0	228,929
777	Suomussalmi	0.5	2,195	82.0	346,939	12.7	53,832	4.7	20,070	0.0	140	100.0	423,176
785	Vaala	0.6	506	88.1	80,341	2.3	2,121	8.7	7,951	0.3	276	100.0	91,195
Total		0.7	12,040	79.9	1,414,012	12.5	221,476	6.7	118,773	0.2	4,350	100.0	1,770,651
<b>Pohjois-Pohjanmaa</b>													
<i>Municipality</i>													
9	Alavieska	2.1	342	78.5	12,567	12.1	1,934	6.7	1,075	0.6	89	100.0	16,007
69	Haapajärvi	1.5	880	72.5	41,909	16.9	9,776	8.9	5,164	0.1	39	100.0	57,768
71	Haapavesi	1.9	1,431	68.9	51,588	15.5	11,579	13.3	9,942	0.4	298	100.0	74,839
72	Hailuoto	2.7	379	72.5	10,112	7.0	981	17.0	2,365	0.8	112	100.0	13,950
84	Haukipudas	1.7	532	74.8	22,810	12.5	3,813	10.2	3,106	0.7	228	100.0	30,489
139	Ii	1.1	1,138	71.7	77,280	12.5	13,517	14.0	15,047	0.8	828	100.0	107,809

(continued)

Table 3a (continued)

	Open regeneration site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
208	2.7	1,262	79.7	37,417	8.2	3,830	9.0	4,227	0.4	189	100.0	46,925
244	1.2	81	74.1	5,223	7.1	499	16.3	1,147	1.4	99	100.0	7,050
247	0.5	219	84.9	35,344	3.0	1,257	11.2	4,649	0.4	179	100.0	41,649
255	1.1	251	79.4	18,492	11.5	2,676	7.7	1,791	0.4	87	100.0	23,298
305	1.2	4,370	75.1	266,889	20.1	71,523	3.4	12,002	0.1	463	100.0	355,247
317	1.0	530	72.9	37,612	12.0	6,212	13.1	6,762	0.9	443	100.0	51,559
425	0.6	214	76.7	27,607	3.2	1,135	18.2	6,562	1.3	478	100.0	35,995
436	1.4	176	64.2	8,311	6.5	845	25.9	3,356	2.0	260	100.0	12,948
483	1.9	328	72.3	12,790	15.9	2,812	9.6	1,691	0.4	76	100.0	17,698
494	1.5	741	83.3	39,941	3.6	1,746	10.8	5,181	0.7	313	100.0	47,923
535	2.6	787	69.0	20,946	20.3	6,149	8.0	2,426	0.1	41	100.0	30,348
563	3.1	1,391	69.5	31,108	16.8	7,522	10.2	4,583	0.3	145	100.0	44,748
564	1.2	229	75.2	14,886	12.0	2,383	10.7	2,123	0.9	169	100.0	19,791
567	1.4	148	76.5	8,154	8.8	933	12.3	1,310	1.0	108	100.0	10,653
603	1.0	338	80.3	28,171	6.5	2,287	11.6	4,081	0.6	193	100.0	35,071
615	0.9	3,428	83.8	309,215	10.6	39,027	4.6	16,862	0.1	392	100.0	368,924
617	1.1	308	77.9	22,534	7.9	2,289	12.3	3,570	0.7	215	100.0	28,916
625	2.4	984	72.7	30,349	10.1	4,204	13.4	5,584	1.5	607	100.0	41,729
626	1.3	1,331	71.7	74,737	16.6	17,327	10.3	10,712	0.1	121	100.0	104,227
630	0.3	192	86.0	51,291	4.7	2,792	8.8	5,230	0.2	147	100.0	59,652
678	1.7	649	72.2	27,746	8.8	3,382	15.8	6,066	1.6	608	100.0	38,450
682	1.2	582	81.9	40,998	4.4	2,204	11.9	5,954	0.6	322	100.0	50,060
691	1.4	465	82.2	28,166	10.2	3,482	6.1	2,078	0.2	73	100.0	34,263
746	1.7	880	83.8	44,540	8.5	4,502	5.9	3,161	0.1	74	100.0	53,158

748	Stiikajoki	1.6	1,093	75.6	51,563	5.7	3,869	16.2	11,031	1.0	654	100.0	68,211
832	Taivaalkoski	1.6	2,848	75.6	137,825	19.3	35,229	3.3	6,027	0.2	302	100.0	182,232
859	Tymävä	0.9	231	82.6	21,574	2.3	604	13.4	3,510	0.8	210	100.0	26,129
889	Utajärvi	0.8	887	88.6	94,804	3.4	3,610	7.1	7,554	0.1	101	100.0	106,956
926	Vihanti	1.8	595	77.7	25,825	7.5	2,477	12.1	4,009	1.0	327	100.0	33,232
972	Yli-Ii	0.9	436	82.0	41,904	7.5	3,845	9.2	4,716	0.3	172	100.0	51,073
973	Ylikiminki	1.4	925	83.3	55,772	7.1	4,761	7.7	5,145	0.5	368	100.0	66,971
977	Ylivieska	2.7	1,080	74.3	30,095	13.8	5,599	9.0	3,651	0.2	80	100.0	40,505
Total		1.3	32,680	77.9	1,898,096	12.0	292,614	8.4	203,450	0.4	9,611	100.0	2,436,451
<b>Lapland</b>													
<i>Municipality</i>													
47	Enontekiö	0.6	603	87.1	82,166	4.5	4,284	7.7	7,281	-	-	100.0	94,334
148	Inari	0.1	328	88.7	631,925	5.5	39,463	5.7	40,400	-	-	100.0	712,116
240	Kemi	2.1	132	40.7	2,605	39.9	2,558	17.3	1,106	0.1	8	100.0	6,409
241	Keminmaa	0.9	391	46.6	21,040	36.5	16,455	15.9	7,152	0.2	84	100.0	45,121
261	Kittilä	1.1	5,346	68.6	320,475	21.1	98,494	9.1	42,361	0.1	319	100.0	466,995
273	Kolari	0.8	1,336	79.1	137,388	13.4	23,243	6.6	11,498	0.1	213	100.0	173,677
320	Kemijärvi	0.7	1,781	86.0	216,898	9.0	22,745	4.3	10,772	0.1	164	100.0	252,360
498	Muonio	0.4	486	84.7	102,629	12.9	15,616	1.9	2,349	0.1	86	100.0	121,167
583	Pelkosenniemi	0.8	939	78.1	94,548	13.7	16,603	7.3	8,781	0.1	135	100.0	121,006
614	Posto	1.2	2,543	82.5	171,208	14.1	29,174	2.1	4,388	0.1	260	100.0	207,573
683	Ranua	1.0	2,019	84.4	169,671	10.0	20,096	4.4	8,837	0.3	512	100.0	201,135
698	Rovaniemi	0.8	4,643	82.1	459,812	12.9	71,968	4.1	23,202	0.0	168	100.0	559,792
732	Salla	0.5	2,064	70.6	269,696	24.5	93,463	4.2	15,901	0.2	793	100.0	381,918
742	Savukoski	0.6	2,761	79.5	349,910	16.5	72,631	3.3	14,375	0.1	274	100.0	439,951
751	Simo	0.7	629	68.1	61,224	18.7	16,803	12.2	10,930	0.3	264	100.0	89,850
758	Sodankylä	0.9	6,096	74.6	498,456	18.9	126,149	5.6	37,363	0.0	82	100.0	668,146
845	Tervola	0.6	621	55.3	60,530	33.0	36,152	10.9	11,945	0.1	157	100.0	109,404

(continued)

Table 3a (continued)

	Open regeneration site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
851	0.9	753	46.1	38,100	35.8	29,610	17.1	14,126	0.1	65	100.0	82,653
854	0.9	1,157	77.0	103,615	15.1	20,295	7.1	9,513	0.1	64	100.0	134,644
890	–	–	62.9	3,961	7.6	478	29.5	1,858	–	–	100.0	6,297
976	0.8	1,095	73.9	104,447	16.2	22,907	8.9	12,617	0.2	256	100.0	141,322
Total	0.7	35,723	77.8	3,900,304	15.5	779,186	5.9	296,756	0.1	3,902	100.0	5,015,871

**Table 3b** Dominant tree species on poorly productive forest land (By forestry centres).

	Open regeneration											
	site		Pine		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
<b>Åland</b>												
<i>Municipality</i>												
35	-	-	52.9	1,396	-	-	29.9	788	17.2	454	100.0	2,638
43	-	-	99.2	2,335	-	-	0.6	14	0.2	4	100.0	2,353
60	-	-	95.9	1,636	-	-	2.7	47	1.4	23	100.0	1,705
62	-	-	87.6	2,452	-	-	3.3	93	9.0	253	100.0	2,798
65	-	-	99.1	2,405	-	-	0.6	15	0.3	7	100.0	2,427
76	-	-	97.6	2,242	-	-	2.0	45	0.4	9	100.0	2,296
170	-	-	94.6	1,446	-	-	3.1	48	2.3	35	100.0	1,529
295	-	-	70.0	1,614	-	-	17.1	394	12.9	297	100.0	2,305
318	-	-	57.8	344	-	-	12.2	72	30.0	178	100.0	594
417	-	-	92.1	1,565	-	-	3.8	64	4.2	71	100.0	1,700
438	-	-	96.0	780	-	-	1.3	11	2.7	22	100.0	813
478	-	-	93.8	161	-	-	3.9	7	2.3	4	100.0	172
736	-	-	97.3	3,370	-	-	0.9	32	1.8	62	100.0	3,463
766	-	-	70.0	364	-	-	10.1	53	19.9	103	100.0	519
771	-	-	96.0	2,145	-	-	1.4	31	2.6	57	100.0	2,233
941	-	-	91.3	2,548	-	-	3.9	108	4.9	136	100.0	2,792
Total	-	-	88.3	26,802	-	-	6.0	1,821	5.7	1,715	100.0	30,338
<b>Rannikko/Etelärannikko</b>												
<i>Municipality</i>												
40	-	-	98.9	4,064	0.8	33	0.2	7	0.1	5	100.0	4,109
49	0.1	2	93.2	1,244	1.6	21	5.0	67	-	-	100.0	1,334
78	-	-	98.3	1,600	1.7	27	0.0	0	-	-	100.0	1,627
91	0.0	0	86.7	234	8.4	23	4.9	13	-	-	100.0	270
92	6.6	21	86.0	275	1.1	4	6.3	20	-	-	100.0	320

(continued)





288	Kronoby-Kruunupyy	0.3	13	91.3	3,372	-	-	6.9	253	1.5	56	100.0	3,694
440	Larsmo-Luoto	0.5	4	74.2	585	0.6	4	23.9	189	0.9	7	100.0	789
475	Malax-Maalahti	-	-	89.1	1,356	0.2	3	0.2	3	10.5	159	100.0	1,521
499	Korsholm-Mustasaari	7.8	233	49.0	1,461	6.2	185	22.1	659	14.9	443	100.0	2,982
545	Närpes-Närpiö	-	-	96.1	2,883	-	-	0.0	1	3.8	114	100.0	2,999
559	Oravais-Oravainen	0.0	0	90.9	999	0.0	0	6.1	67	3.0	33	100.0	1,099
598	Jakobstad-Pietarsaari	-	-	88.2	322	-	-	10.2	37	1.6	6	100.0	365
599	Pedersöre-Pedersören kunta	0.8	34	90.8	3,679	-	-	8.0	323	0.4	17	100.0	4,053
893	Nykarleby-Uusikaarlepyy	0.1	4	91.8	3,071	-	-	5.7	190	2.4	80	100.0	3,345
905	Vaasa-Vasa	0.0	0	58.3	157	4.7	13	0.1	0	36.9	99	100.0	269
945	Vörå-Maxmo-Vöyri-Maksamaa	0.0	0	90.2	1,610	0.5	9	2.4	42	6.9	123	100.0	1,784
Total		1.1	288	85.0	22,173	0.8	214	8.0	2,079	5.2	1,347	100.0	26,101
<b>Lounais-Suomi</b>													
<i>Municipality</i>													
6	Alastaro	-	-	97.8	392	1.5	6	0.5	2	0.2	1	100.0	401
17	Askainen	3.0	10	93.1	294	-	-	0.4	1	3.4	11	100.0	315
19	Aura	-	-	95.1	145	-	-	4.6	7	0.4	1	100.0	153
50	Eura	-	-	95.0	958	2.7	27	1.9	19	0.4	4	100.0	1,009
51	Eurajoki	-	-	97.3	659	0.7	5	0.7	5	1.4	9	100.0	678
73	Halikko	1.3	15	95.3	1,105	0.0	0	-	-	3.4	39	100.0	1,159
79	Harjavalta	-	-	99.8	295	-	-	0.0	0	0.1	0	100.0	295
99	Honkajoki	-	-	92.7	1,268	-	-	7.0	96	0.3	4	100.0	1,369
102	Huittinen	-	-	99.1	686	0.7	5	0.1	0	0.2	1	100.0	692
181	Jämijärvi	0.0	0	90.5	533	-	-	6.2	36	3.3	19	100.0	588
202	Kaarina	3.0	9	94.5	285	-	-	0.0	0	2.5	8	100.0	302
214	Kankaanpää	-	-	89.6	2,169	-	-	9.1	221	1.2	30	100.0	2,421
230	Karvia	-	-	91.6	2,215	-	-	8.4	204	0.0	0	100.0	2,419
252	Kiikala	0.2	1	97.8	701	0.3	2	1.1	8	0.6	5	100.0	717
254	Kiikoinen	-	-	80.6	228	-	-	14.5	41	4.9	14	100.0	283
259	Kisko	0.2	1	93.5	751	0.3	2	2.3	19	3.8	30	100.0	803

(continued)

Table 3b (continued)

	Open regeneration						Other deciduous tree species						Total (ha)
	site		Pine		Spruce		Birch		Other deciduous tree species		Total		
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	
262	—	—	91.9	113	3.6	4	2.7	3	1.9	2	100.0	123	
271	—	—	95.6	813	—	—	3.3	28	1.1	9	100.0	850	
284	—	—	93.3	202	5.8	13	0.8	2	0.2	0	100.0	217	
304	0.6	17	96.9	2,518	—	—	—	—	—	—	—	—	
308	—	—	97.5	94	0.0	0	2.1	2	0.4	0	100.0	96	
319	—	—	96.4	843	1.9	17	1.6	14	0.1	1	100.0	874	
400	0.0	0	95.8	1,595	0.6	10	2.1	35	1.6	26	100.0	1,666	
406	0.3	2	97.6	650	0.9	6	0.7	5	0.5	3	100.0	666	
413	—	—	78.9	627	—	—	16.4	130	4.7	38	100.0	795	
419	2.0	3	95.2	144	0.0	0	0.5	1	2.2	3	100.0	152	
423	0.1	0	96.7	528	—	—	2.9	16	0.4	2	100.0	546	
430	—	—	92.4	593	7.4	48	0.0	0	0.1	1	100.0	642	
442	—	—	97.5	133	0.0	0	—	—	—	3	100.0	137	
480	—	—	98.1	359	0.1	0	1.7	6	0.1	0	100.0	365	
481	0.9	4	96.2	403	0.8	3	0.4	2	1.7	7	100.0	419	
482	—	—	97.2	239	2.7	7	0.0	0	0.2	0	100.0	246	
484	—	—	79.0	615	—	—	11.1	86	10.0	78	100.0	779	
485	1.2	5	97.8	413	—	—	0.2	1	0.8	4	100.0	422	
501	—	—	96.8	214	—	—	3.1	7	0.1	0	100.0	221	
503	0.1	2	96.3	1,866	1.5	30	1.6	30	0.5	10	100.0	1,938	
529	1.7	6	95.6	360	—	—	—	—	—	—	—	—	
531	—	—	99.4	159	0.1	0	—	—	—	6	100.0	376	
537	—	—	75.0	628	—	—	19.0	159	6.0	50	100.0	837	
538	—	—	96.8	716	1.4	10	1.3	10	0.5	3	100.0	739	
561	—	—	97.5	211	—	—	2.3	5	0.2	1	100.0	216	
577	1.5	17	96.4	1,131	—	—	—	—	—	25	100.0	1,172	
586	—	—	97.9	1,502	—	—	2.1	32	0.0	1	100.0	1,534	
587	—	—	97.4	291	—	—	2.5	7	0.2	0	100.0	299	

602	Piikkiö	2.3	10	95.2	413	-	-	0.0	0	2.4	10	100.0	433
608	Pomarkku	0.0	0	79.0	652	-	-	16.4	135	4.7	38	100.0	825
609	Pori	-	-	65.0	335	0.0	0	14.1	73	20.9	108	100.0	516
631	Pyhäranta	-	-	95.5	394	0.0	0	2.1	9	2.3	10	100.0	412
636	Pöytyä	0.1	1	97.3	905	-	-	2.4	23	0.1	1	100.0	930
680	Raisio	3.0	7	93.4	212	0.1	0	0.0	0	3.5	8	100.0	227
684	Rauma	0.1	1	96.8	1,012	0.1	1	0.7	7	2.3	24	100.0	1,045
704	Rusko	0.9	2	97.0	157	0.7	1	0.1	0	1.2	2	100.0	162
705	Rymättylä	0.8	19	98.0	2,197	-	-	0.3	7	0.8	18	100.0	2,241
734	Salo	-	-	95.2	302	-	-	4.4	14	0.3	1	100.0	317
738	Sauvo	0.9	13	96.8	1,318	0.2	2	0.0	0	2.1	29	100.0	1,362
747	Siikainen	0.0	0	79.9	958	-	-	13.2	158	6.8	82	100.0	1,199
761	Somero	0.2	2	95.6	848	3.2	28	0.3	3	0.7	6	100.0	887
776	Suomusjärvi	0.7	4	97.1	542	1.0	5	0.3	2	1.0	5	100.0	559
783	Säkylä	-	-	97.1	591	1.5	9	1.3	8	0.2	1	100.0	608
784	Särkisalo-Finby	0.4	2	97.8	398	0.2	1	0.1	0	1.6	6	100.0	406
833	Taivassalo	1.3	17	97.2	1,273	-	-	0.1	1	1.5	20	100.0	1,310
838	Tarvasjoki	-	-	93.7	121	-	-	6.0	8	0.3	0	100.0	130
853	Turku-Åbo	2.0	23	94.9	1,070	0.1	1	0.3	4	2.7	30	100.0	1,128
886	Ulvila	-	-	79.6	853	0.0	0	17.5	187	2.9	31	100.0	1,071
895	Uusikaupunki	0.9	28	96.0	2,822	0.1	4	0.3	8	2.6	77	100.0	2,939
906	Vähto	-	-	94.1	207	2.8	6	2.7	6	0.4	1	100.0	220
913	Vampula	-	-	99.2	87	0.3	0	0.2	0	0.3	0	100.0	87
918	Vehmaa	2.5	20	94.4	772	0.0	0	0.0	0	3.2	26	100.0	818
920	Velkua	0.5	3	98.1	594	-	-	0.5	3	0.9	5	100.0	605
979	Yläne	0.3	4	95.5	1,616	1.6	28	2.5	43	0.1	1	100.0	1,692
Total		0.5	248	93.6	51,291	0.5	282	3.6	1,964	1.9	1,035	100.0	54,820
<b>Häme-Uusimaa</b>													
<i>Municipality</i>													
15	Artjärvi	-	-	89.5	303	6.8	23	3.7	12	-	-	100.0	338
16	Asikkala	2.4	15	73.7	449	6.9	42	17.1	104	-	-	100.0	610
18	Askola	-	-	97.2	188	-	-	2.8	5	-	-	100.0	193

(continued)

Table 3b (continued)

	Open regeneration site			Pine			Spruce			Birch			Other deciduous tree species			Total	
	(%)	(ha)	(%)	(%)	(ha)	(%)	(%)	(ha)	(%)	(%)	(ha)	(%)	(%)	(ha)	(%)	(ha)	(%)
61	-	-	97.7	182	-	-	2.3	4	-	-	100.0	187	-	-	100.0	187	-
81	-	-	38.5	138	-	-	61.5	222	-	-	100.0	360	-	-	100.0	360	-
82	-	-	93.7	429	-	-	6.3	29	-	-	100.0	457	-	-	100.0	457	-
83	-	-	81.0	193	-	-	19.0	45	-	-	100.0	239	-	-	100.0	239	-
86	8.6	30	84.5	297	-	-	6.9	24	-	-	100.0	351	-	-	100.0	351	-
98	-	-	83.4	227	3.7	10	13.0	35	-	-	100.0	273	-	-	100.0	273	-
103	-	-	98.0	147	-	-	2.0	3	-	-	100.0	150	-	-	100.0	150	-
106	16.4	71	79.2	345	-	-	4.4	19	-	-	100.0	435	-	-	100.0	435	-
109	-	-	73.7	83	-	-	26.3	30	-	-	100.0	112	-	-	100.0	112	-
111	-	-	82.9	1,087	2.9	38	14.2	186	-	-	100.0	1,311	-	-	100.0	1,311	-
165	0.0	0	75.2	352	-	-	24.8	116	-	-	100.0	469	-	-	100.0	469	-
169	-	-	96.8	50	-	-	3.2	2	-	-	100.0	52	-	-	100.0	52	-
186	21.3	5	66.1	16	-	-	12.7	3	-	-	100.0	24	-	-	100.0	24	-
210	-	-	95.7	186	-	-	4.3	8	-	-	100.0	194	-	-	100.0	194	-
223	-	-	97.6	207	-	-	2.4	5	-	-	100.0	213	-	-	100.0	213	-
224	22.9	29	56.8	71	-	-	20.2	25	-	-	100.0	126	-	-	100.0	126	-
245	10.1	2	84.0	14	-	-	5.9	1	-	-	100.0	17	-	-	100.0	17	-
283	-	-	89.7	57	-	-	10.3	7	-	-	100.0	64	-	-	100.0	64	-
316	-	-	97.5	231	-	-	2.5	6	-	-	100.0	237	-	-	100.0	237	-
398	-	-	46.0	60	13.5	18	40.5	53	-	-	100.0	131	-	-	100.0	131	-
401	-	-	91.8	306	-	-	8.2	27	-	-	100.0	334	-	-	100.0	334	-
433	6.8	30	80.4	360	-	-	12.8	57	-	-	100.0	448	-	-	100.0	448	-
444	-	-	81.4	88	-	-	18.6	20	-	-	100.0	108	-	-	100.0	108	-
504	-	-	97.0	295	-	-	3.0	9	-	-	100.0	304	-	-	100.0	304	-
505	5.9	36	90.5	554	-	-	3.6	22	-	-	100.0	612	-	-	100.0	612	-
532	-	-	54.0	462	8.5	73	37.5	321	-	-	100.0	856	-	-	100.0	856	-
540	-	-	92.0	242	-	-	8.0	21	-	-	100.0	263	-	-	100.0	263	-

543	Nurmijärvi	28.1	95	55.4	187	12.0	41	4.5	15	-	100.0	338	
560	Orimattila	3.4	26	83.7	650	1.6	13	11.3	88	-	100.0	776	
576	Pudasjoki	5.8	15	88.3	233	-	-	5.9	16	-	100.0	264	
611	Pomainen	8.0	12	81.5	118	-	-	10.6	15	-	100.0	145	
616	Pukkila	-	-	81.6	87	-	-	18.4	20	-	100.0	106	
692	Renko	-	-	89.5	304	-	-	10.5	36	-	100.0	340	
694	Riihimäki	20.5	22	70.6	76	-	-	8.9	10	-	100.0	108	
737	Sammatti	-	-	97.5	106	-	-	2.5	3	-	100.0	109	
781	Sysmä	3.6	10	79.9	230	0.8	2	15.7	45	-	100.0	288	
834	Tammela	-	-	98.0	829	-	-	2.0	17	-	100.0	846	
855	Tuulos	-	-	72.8	110	-	-	27.2	41	-	100.0	151	
858	Tuusula	26.6	52	64.8	128	-	-	8.6	17	-	100.0	197	
927	Vihti	12.2	41	49.2	165	-	-	38.6	130	-	100.0	336	
981	Ypäjä	-	-	70.4	74	-	-	29.6	31	-	100.0	105	
Total		3.6	492	80.4	10,919	1.9	259	14.0	1,907	-	100.0	13,576	
<b>Kaakkois-Suomi</b>													
<i>Municipality</i>													
44	Elimäki	0.3	1	89.3	283	4.4	14	5.5	18	0.2	100.0	317	
75	Hamina	0.5	5	97.1	1,074	0.0	0	1.2	13	1.2	100.0	1,106	
142	Iitti	0.5	4	93.1	754	0.8	7	4.4	36	1.1	100.0	810	
153	Imatra	1.7	1	77.6	45	-	-	4.2	2	17.5	100.0	58	
163	Jaala	0.3	2	93.2	616	-	-	0.6	4	5.8	100.0	661	
173	Joutseno	0.0	0	68.0	83	0.1	0	15.2	18	17.2	21	100.0	122
285	Kotka	0.6	4	96.3	660	0.2	1	1.5	10	1.5	100.0	685	
286	Kouvola	0.0	0	96.6	28	-	-	2.6	1	1.2	0	100.0	29
306	Kuusankoski	0.0	0	95.7	88	0.0	0	1.4	1	3.1	3	100.0	92
405	Lappeenranta	0.3	1	79.2	262	0.6	2	19.2	63	1.0	3	100.0	331
416	Lemi	0.0	0	89.1	106	1.2	1	6.1	7	4.4	5	100.0	119
441	Luumäki	0.3	3	94.3	952	0.2	2	3.6	37	1.6	16	100.0	1,010

(continued)

Table 3b (continued)

	Open regeneration site						Other deciduous tree species						Total	
	Pine		Spruce		Birch		Spruce		Birch		Other deciduous tree species		Total	
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)
489	0.4	2	90.5	436	0.0	0	9.2	44	0.1	0	100.0	482		
580	0.8	2	81.3	195	0.1	0	15.2	36	2.8	7	100.0	240		
624	0.3	3	87.1	934	0.7	8	11.3	122	0.5	5	100.0	1,072		
689	0.0	0	85.3	122	0.1	0	8.0	11	6.8	10	100.0	143		
700	0.4	4	86.6	880	0.3	3	9.9	101	2.8	28	100.0	1,016		
739	0.3	2	96.0	719	-	-	1.1	8	2.7	20	100.0	749		
754	0.4	5	96.9	1,203	0.5	6	1.6	20	0.6	8	100.0	1,242		
775	0.2	1	98.4	477	-	-	1.5	7	0.1	0	100.0	485		
831	0.7	2	87.2	239	0.1	0	6.1	17	5.8	16	100.0	274		
909	0.4	5	95.1	1,285	0.0	0	1.8	25	2.7	36	100.0	1,351		
935	0.3	2	92.7	594	0.1	0	5.6	36	1.4	9	100.0	641		
978	0.2	1	86.3	397	0.0	0	13.5	62	0.0	0	100.0	460		
Total	0.4	50	92.1	12,429	0.3	46	5.2	700	2.0	270	100.0	13,495		
<b>Pirkanmaa</b>														
<i>Municipality</i>														
20	-	-	77.6	39	0.8	0	19.3	10	2.4	1	100.0	50		
108	-	-	82.4	406	0.1	1	17.4	86	0.1	1	100.0	493		
143	-	-	88.0	1,180	0.5	6	10.9	146	0.6	8	100.0	1,340		
177	-	-	84.1	213	2.0	5	13.0	33	0.9	2	100.0	253		
211	-	-	80.4	288	0.7	2	17.7	63	1.3	5	100.0	358		
250	-	-	92.9	978	-	-	6.6	69	0.5	5	100.0	1,053		
289	0.7	1	79.8	117	1.5	2	17.5	26	0.4	1	100.0	147		
303	-	-	88.4	1,348	0.1	1	11.4	174	0.2	2	100.0	1,525		
310	-	-	82.2	104	2.7	3	13.2	17	1.9	2	100.0	126		
418	-	-	63.8	66	0.0	0	35.7	37	0.4	0	100.0	104		
493	-	-	82.3	188	0.0	0	17.5	40	0.3	1	100.0	229		
506	-	-	65.9	25	8.2	3	11.7	4	14.2	5	100.0	38		

536	Nokia	–	–	119	0.1	0	27.8	46	0.0	0	100.0	165
562	Orivesi	0.2	1	527	1.0	7	16.5	107	0.8	5	100.0	647
581	Parkano	–	–	3,560	0.0	1	6.6	254	0.4	15	100.0	3,829
604	Pirkkala	–	–	15	0.0	0	46.6	14	0.1	0	100.0	29
619	Punkalaidun	–	–	590	6.1	38	0.3	2	0.1	1	100.0	631
635	Päikkäne	0.1	0	314	2.7	11	16.0	63	1.3	5	100.0	392
702	Ruovesi	–	–	795	1.0	9	11.3	103	1.0	9	100.0	916
837	Tampere	–	–	79.8	250	0	19.9	62	0.3	1	100.0	313
887	Urajala	–	–	513	2.6	15	8.3	49	1.8	11	100.0	588
908	Valkeakoski	–	–	125	1.3	2	17.1	27	1.9	3	100.0	156
912	Vammala	–	–	686	0.1	0	15.4	125	0.4	3	100.0	814
922	Vesilahti	–	–	142	0.2	0	22.5	41	0.4	1	100.0	184
933	Vilppula	–	–	301	4.5	17	13.4	52	4.7	18	100.0	389
936	Virrat	–	–	2,402	0.0	0	6.8	178	1.3	33	100.0	2,613
980	Ylöjärvi	–	–	240	0.1	0	21.6	66	0.4	1	100.0	307
988	Aetsä	–	–	83.8	179	0.0	15.5	33	0.7	1	100.0	214
Total		0.0	3	15,710	0.7	126	10.8	1,926	0.8	140	100.0	17,906
<b>Etelä-Savo</b>												
<i>Municipality</i>												
46	Enonkoski	–	–	140	0.2	0	5.6	8	–	–	100.0	149
90	Heinävesi	–	–	551	1.5	9	3.8	22	–	–	100.0	582
97	Hirvensalmi	–	–	537	0.2	2	17.9	117	–	–	100.0	656
171	Joroinen	–	–	702	3.6	30	11.4	94	–	–	100.0	826
178	Juva	–	–	1,777	3.1	62	7.2	143	–	–	100.0	1,982
213	Kangasniemi	–	–	1,354	0.7	12	12.9	202	–	–	100.0	1,568
246	Kerimäki	–	–	672	0.1	1	6.6	48	–	–	100.0	721
491	Mikkeli	–	–	2,865	0.6	19	8.2	257	–	–	100.0	3,141
507	Mäntyharju	0.1	2	1,090	7.6	107	15.1	214	0.1	1	100.0	1,415
588	Pertunmaa	–	–	305	–	–	16.4	60	0.0	0	100.0	364
593	Pieksämäki	–	–	87.2	2,907	1.6	11.1	371	–	–	100.0	3,332
618	Punkaharju	–	–	80.3	262	0.3	19.4	63	–	–	100.0	326

(continued)





315	Kälviä	-	-	96.4	5,723	-	-	3.2	192	0.3	19	100.0	5,935
399	Lathia	-	-	99.9	1,783	0.1	2	0.0	0	0.0	0	100.0	1,785
403	Lappajärvi	-	-	96.7	2,095	-	-	3.3	71	-	-	100.0	2,166
408	Lapua	2.8	94	94.5	3,163	-	-	2.7	89	-	-	100.0	3,346
414	Lehtimäki	-	-	95.9	2,295	-	-	4.1	98	-	-	100.0	2,393
421	Lesijärvi	-	-	99.6	4,552	-	-	0.3	15	0.1	3	100.0	4,570
429	Lohtaja	-	-	95.5	2,862	-	-	4.2	127	0.3	8	100.0	2,997
544	Nurmo	2.2	38	96.1	1,688	-	-	1.7	30	-	-	100.0	1,756
584	Perho	-	-	99.1	4,511	-	-	0.9	39	0.0	2	100.0	4,551
743	Seinäjoki	0.7	15	97.0	2,153	-	-	2.3	51	0.0	0	100.0	2,219
759	Soini	-	-	96.5	3,449	-	-	3.2	114	0.3	12	100.0	3,576
846	Teuva	0.0	0	99.8	2,762	-	-	0.2	5	0.0	1	100.0	2,768
849	Toholampi	-	-	99.6	4,237	-	-	0.4	17	-	-	100.0	4,254
863	Toysä	-	-	94.5	1,003	-	-	5.5	59	-	-	100.0	1,062
885	Ullava	-	-	99.8	1,158	-	-	0.2	2	0.0	0	100.0	1,160
924	Veteli	-	-	99.4	4,125	-	-	0.6	26	0.0	0	100.0	4,151
934	Vimpeli	-	-	94.8	1,742	-	-	5.2	96	-	-	100.0	1,837
942	Vähäkyrö	-	-	97.9	190	2.1	4	0.0	0	0.0	0	100.0	194
971	Ylihärmä	0.2	2	94.5	949	-	-	5.3	53	-	-	100.0	1,004
975	Ylistaro	0.2	4	97.5	1,728	-	-	2.3	41	0.0	0	100.0	1,772
989	Ähtäri	1.0	30	95.9	3,007	-	-	2.9	92	0.1	4	100.0	3,134
Total		0.3	302	97.4	105,121	0.0	6	2.2	2,422	0.1	129	100.0	107,981
<b>Keski-Suomi</b>													
<i>Municipality</i>													
77	Hankasalmi	-	-	85.4	147	-	-	14.6	25	-	-	100.0	172
172	Joutsa	-	-	61.6	177	5.9	17	32.5	93	-	-	100.0	287
179	Jyväskylä	-	-	82.4	31	0.5	0	17.1	6	-	-	100.0	37
180	Jyväskylän mlk	-	-	88.9	210	0.1	0	10.9	26	-	-	100.0	236
182	Jämsä	0.0	0	77.6	710	8.0	73	13.7	126	0.7	7	100.0	915
183	Jämsänkoski	-	-	86.8	392	5.4	24	7.8	35	-	-	100.0	452
216	Kannonkoski	-	-	98.5	581	-	-	1.4	8	0.1	1	100.0	590
226	Karstula	0.0	0	99.0	3,269	0.0	0	0.7	21	0.3	11	100.0	3,301

(continued)

Table 3b (continued)

	Open regeneration site						Other deciduous tree species						Total (ha)
	Pine		Spruce		Birch		Other deciduous tree species		Total				
	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)			
249	–	–	96.7	2,334	0.2	4	3.1	75	–	–	100.0	2,413	
256	–	–	98.5	2,458	–	–	0.7	18	0.7	19	100.0	2,495	
265	–	–	98.8	1,712	–	–	0.5	9	0.7	12	100.0	1,733	
275	–	–	98.7	241	–	–	1.3	3	–	–	100.0	244	
277	–	–	81.4	270	7.0	23	11.6	38	–	–	100.0	332	
291	–	–	71.6	478	11.9	79	16.5	110	–	–	100.0	667	
312	0.1	3	98.7	3,663	0.1	6	0.5	17	0.6	24	100.0	3,713	
410	–	–	92.0	272	–	–	8.0	24	–	–	100.0	296	
415	–	–	88.7	690	1.7	14	9.5	74	–	–	100.0	778	
435	–	–	71.4	80	7.8	9	20.9	23	–	–	100.0	112	
495	–	–	99.9	1,960	–	–	0.1	2	–	–	100.0	1,962	
500	–	–	76.3	46	6.5	4	17.2	10	–	–	100.0	60	
592	–	–	93.9	389	1.1	5	4.9	20	–	–	100.0	414	
601	–	–	97.7	3,325	–	–	1.1	36	1.3	43	100.0	3,404	
633	–	–	99.6	1,111	–	–	0.4	5	–	–	100.0	1,116	
729	–	–	99.0	827	–	–	0.7	6	0.3	3	100.0	835	
850	–	–	82.7	154	2.2	4	15.1	28	–	–	100.0	186	
892	–	–	99.8	411	–	–	0.2	1	–	–	100.0	412	
931	–	–	98.3	1,297	–	–	1.5	19	0.2	3	100.0	1,319	
992	–	–	99.0	719	–	–	1.0	7	0.0	0	100.0	726	
Total	0.0	3	95.7	27,954	0.9	262	3.0	869	0.4	121	100.0	29,209	
<b>Pohjois-Savo</b>													
<i>Municipality</i>													
140	–	–	87.5	433	3.6	18	8.9	44	–	–	100.0	495	
174	–	–	92.6	297	6.4	21	1.0	3	–	–	100.0	320	

204	Kaavi	92.4	655	1.5	10	7.3	43	0.0	0	100.0	708
227	Karttula	91.3	221	-	-	8.7	21	-	-	100.0	242
239	Keitele	93.6	607	-	-	5.5	36	0.9	6	100.0	649
263	Kiuruvesi	89.9	2,022	0.8	18	9.3	209	-	-	100.0	2,248
297	Kuopio	87.5	307	-	-	12.5	44	-	-	100.0	351
402	Lapinlahti	92.0	452	4.0	20	4.1	20	-	-	100.0	492
420	Leppävirta	73.0	214	-	-	27.0	79	-	-	100.0	293
476	Maaninka	92.4	180	3.7	7	3.9	8	-	-	100.0	195
534	Nilsia	95.2	597	4.8	30	0.1	1	-	-	100.0	627
595	Pielavesi	94.5	1,427	2.2	34	2.7	41	0.5	8	100.0	1,510
686	Rautalamppi	90.2	199	-	-	9.8	22	-	-	100.0	221
687	Rautavaara	96.0	4,817	2.2	111	1.8	90	-	-	100.0	5,019
749	Siilinjärvi	90.7	102	3.0	3	6.3	7	-	-	100.0	113
762	Sonkajärvi	92.5	4,781	1.8	91	5.7	295	-	-	100.0	5,167
778	Suonenjoki	85.0	173	-	-	15.0	31	-	-	100.0	204
844	Tervo	88.1	96	0.1	0	11.7	13	-	-	100.0	109
857	Tuusniemi	89.5	250	-	-	10.5	29	-	-	100.0	279
915	Varkaus	90.8	127	0.8	1	8.3	12	-	-	100.0	139
916	Värpäsjärvi	92.3	551	3.4	20	4.3	26	-	-	100.0	596
921	Vesanto	93.7	149	-	-	5.7	9	0.7	1	100.0	159
925	Vieremä	88.7	1,682	1.4	27	9.8	187	-	-	100.0	1,896
Total		92.3	20,337	1.9	412	5.8	1,276	0.0	6	100.0	22,031
<b>Pohjois-Karjala</b>											
<i>Municipality</i>											
45	Eno	96.4	2,150	1.1	25	2.4	54	0.0	0	100.0	2,230
146	Ilomantsi	93.0	14,468	0.2	38	6.8	1,054	0.0	1	100.0	15,562
167	Joensuu	97.0	1,781	1.2	21	1.8	34	-	-	100.0	1,836
176	Juuka	89.7	3,870	0.4	16	10.0	431	0.0	0	100.0	4,316
248	Kesälahti	97.3	358	-	-	2.7	10	-	-	100.0	368
260	Kitee	93.5	643	0.0	0	6.4	44	-	-	100.0	688
276	Kontiolahti	96.9	917	-	-	3.1	30	-	-	100.0	946
309	Outokumpu	87.9	349	3.5	14	8.5	34	-	-	100.0	397

(continued)



84	Haukipudas	94.3	2,811	0.4	12	5.3	159	-	-	100.0	2,982
139	Ii	92.3	11,809	0.8	103	6.9	885	0.0	1	100.0	12,799
208	Kalajoki	99.4	3,664	-	-	0.6	21	-	-	100.0	3,685
244	Kempele	85.2	941	0.1	1	14.6	161	0.1	1	100.0	1,105
247	Kestilä	98.2	6,280	0.0	0	1.8	112	-	-	100.0	6,392
255	Kiiminki	95.8	2,354	0.1	3	4.1	100	-	-	100.0	2,457
305	Kuusamo	86.0	54,841	10.3	6,601	3.0	1,928	0.7	431	100.0	63,800
317	Kärsämäki	98.4	4,373	-	-	1.6	70	-	-	100.0	4,444
425	Liminka	92.7	7,469	0.1	7	7.1	574	0.1	5	100.0	8,055
436	Lumijoki	72.5	966	-	-	26.0	346	1.5	20	100.0	1,332
483	Merijärvi	97.8	745	0.4	3	1.8	14	-	-	100.0	762
494	Muhos	95.3	7,467	0.3	24	4.4	347	0.0	1	100.0	7,839
535	Nivala	96.0	992	-	-	4.0	41	-	-	100.0	1,033
563	Oulainen	97.1	2,387	0.0	0	2.9	71	-	-	100.0	2,458
564	Oulu	89.6	1,044	0.2	3	10.1	118	0.0	0	100.0	1,165
567	Oulunsalo	88.9	1,304	0.1	1	10.3	151	0.8	12	100.0	1,467
603	Piippola	97.0	3,326	0.1	3	2.9	101	-	-	100.0	3,430
615	Pudasjärvi	89.4	59,358	6.2	4,112	4.4	2,911	0.0	3	100.0	66,384
617	Pulkkila	97.2	1,952	0.0	1	2.8	55	-	-	100.0	2,008
625	Pyhäjoki	95.3	2,371	-	-	4.7	117	-	-	100.0	2,488
626	Pyhäsalmi	98.7	5,981	-	-	1.3	82	-	-	100.0	6,063
630	Pyhäntä	98.8	7,947	0.0	1	1.2	99	-	-	100.0	8,047
678	Raabe	87.2	2,090	0.0	0	12.8	308	0.0	0	100.0	2,398
682	Rantsila	96.9	7,624	0.0	0	3.1	240	-	-	100.0	7,864
691	Reisjärvi	98.9	2,894	-	-	1.1	31	-	-	100.0	2,926
746	Sievi	99.7	7,488	-	-	0.3	22	-	-	100.0	7,511
748	Siikajoki	89.9	7,794	0.0	4	10.0	866	0.1	11	100.0	8,675
832	Taivalkoski	78.3	22,292	16.8	4,795	4.7	1,343	0.1	34	100.0	28,464
859	Tyrmävä	93.9	5,014	0.5	27	5.6	300	0.0	0	100.0	5,340
889	Utajärvi	93.6	18,569	1.2	230	5.3	1,044	0.0	0	100.0	19,844
926	Vihanti	95.4	3,863	-	-	4.6	186	-	-	100.0	4,049
972	Yli-Ii	92.9	6,685	0.8	55	6.3	454	-	-	100.0	7,195

(continued)



**Table 4a** Age class distribution on forest land (By forestry centres).

	Open regeneration site										Forest land total									
	(ha) (%)	1–20 years (ha) (%)	21–40 years (ha) (%)	41–60 years (ha) (%)	61–80 years (ha) (%)	81–100 years (ha) (%)	101–120 years (ha) (%)	121–140 years (ha) (%)	141+ years (ha) (%)	(ha) (%)										
<b>Åland</b>																				
<i>Municipality</i>																				
35 Brändö	34	1.2	284	9.8	199	6.8	415	14.3	1,373	47.3	266	9.2	63	2.2	20	0.7	248	8.6	2,901	100.0
43 Eckerö	52	0.9	793	14.4	1,360	24.9	543	9.9	763	13.8	654	11.9	664	12.0	458	8.3	228	4.1	5,515	100.0
60 Finström	13	0.2	1,274	20.1	1,513	23.7	760	12.0	892	14.1	720	11.4	597	9.4	372	5.9	188	3.0	6,330	100.0
62 Föglö	0	0.0	835	13.6	1,194	19.3	907	14.6	1,062	17.1	604	9.8	865	14.0	419	6.8	310	5.0	6,196	100.0
65 Geta	5	0.2	484	14.6	792	23.8	340	10.2	507	15.3	391	11.8	390	11.7	265	8.0	148	4.5	3,323	100.0
76 Hammarland	19	0.3	1,134	16.3	1,755	25.2	836	12.0	1,002	14.4	798	11.5	695	10.0	468	6.7	245	3.5	6,953	100.0
170 Jomala	33	0.4	1,416	18.8	1,836	24.3	912	12.1	992	13.1	889	11.8	778	10.3	468	6.2	226	3.0	7,551	100.0
295 Kumlinge	9	0.3	453	14.0	405	12.6	433	13.4	902	28.0	305	9.5	402	12.5	164	5.1	152	4.7	3,225	100.0
318 Kökar	–	–	359	27.6	80	6.2	410	31.4	410	31.4	55	4.2	144	11.0	3	0.2	2	0.1	1,304	100.0
417 Lemland	34	0.5	1,184	18.6	1,581	24.9	790	12.4	959	15.1	699	11.0	575	9.1	371	5.8	158	2.5	6,350	100.0
438 Lumparland	4	0.2	242	14.3	362	21.4	195	11.5	255	15.1	212	12.5	220	13.0	112	6.6	92	5.4	1,693	100.0
478 Mariehamn	5	1.1	117	25.5	107	23.4	45	9.7	63	13.6	42	9.2	41	9.0	27	5.8	13	2.7	459	100.0
736 Saltvik	14	0.2	781	12.5	1,332	21.4	765	12.3	901	14.5	849	13.6	774	12.4	477	7.7	337	5.4	6,231	100.0
766 Sottunga	1	0.2	183	20.9	132	15.1	127	14.5	214	24.4	67	7.7	94	10.8	29	3.4	26	3.0	874	100.0
771 Sund	13	0.2	815	15.8	1,199	23.2	628	12.2	706	13.7	632	12.3	583	11.3	352	6.8	230	4.5	5,157	100.0
941 Vårdö	11	0.3	501	13.4	741	19.9	413	11.1	647	17.3	428	11.5	504	13.5	251	6.7	235	6.3	3,732	100.0
Total	241	0.4	10,860	16.0	14,589	21.5	8,361	12.3	11,646	17.2	7,612	11.2	7,391	10.9	4,255	6.3	2,839	4.2	67,794	100.0
<b>Rannikko/Etelärannikko</b>																				
<i>Municipality</i>																				
40 Dragsfjärd	103	0.7	1,833	12.2	2,029	13.5	2,022	13.4	2,696	17.9	3,310	21.9	2,066	13.7	774	5.1	258	1.7	15,092	100.0
49 Espoo-Esbo	4	0.0	2,129	14.0	2,441	16.0	2,776	18.2	2,739	18.0	2,339	15.3	1,702	11.2	581	3.8	546	3.6	15,256	100.0
78 Hanko-Hangö	7	0.1	662	9.7	1,079	15.8	2,328	34.0	1,049	15.3	983	14.4	404	5.9	189	2.8	143	2.1	6,845	100.0
91 Helsinki-	36	0.6	1,678	25.7	1,334	20.5	1,007	15.4	915	14.0	879	13.5	376	5.8	159	2.4	141	2.2	6,526	100.0
<i>Helsingfors</i>																				
92 antaa-Vanda	45	0.5	2,223	22.0	1,971	19.5	2,083	20.6	1,623	16.1	1,266	12.5	530	5.2	216	2.1	155	1.5	10,113	100.0
101 Houtskär-	–	–	1,289	19.0	402	5.9	787	11.6	513	7.6	1,585	23.4	1,632	24.1	118	1.7	456	6.7	6,782	100.0
<i>Houtskari</i>																				
149 Ingå-Inkoo	229	1.3	2,454	14.1	1,806	10.4	3,111	17.9	2,817	16.2	3,995	23.0	1,853	10.7	499	2.9	608	3.5	17,372	100.0
150 Inö	–	–	536	14.5	156	4.2	498	13.5	414	11.2	993	26.9	648	17.5	137	3.7	309	8.4	3,692	100.0
220 Karis-Karjaa	170	1.5	2,213	19.6	1,744	15.4	2,227	19.7	1,690	15.0	2,084	18.5	742	6.6	221	2.0	203	1.8	11,293	100.0
235 Kauniainen-	–	–	25	12.6	34	17.0	33	16.6	37	18.5	35	17.6	22	10.8	9	4.5	5	2.4	201	100.0
<i>Grankulla</i>																				
243 Kimito-Kemtiö	57	0.3	2,123	12.2	2,608	15.0	2,246	12.9	3,832	22.0	3,564	20.5	1,911	11.0	806	4.6	242	1.4	17,390	100.0

(continued)





545	Närpes-Närpiö	459	0.7	12,989	20.2	9,759	15.2	7,377	11.5	9,856	15.3	12,731	19.8	7,705	12.0	2,483	3.9	878	1.4	64,237	100.0
559	Oravais- Oravainen	295	2.3	2,507	19.8	2,391	18.9	2,170	17.2	1,410	11.1	1,644	13.0	1,145	9.1	667	5.3	427	3.4	12,657	100.0
598	Jakobstad-	145	2.6	1,167	21.0	1,063	19.1	1,121	20.2	652	11.7	583	10.5	376	6.8	268	4.8	179	3.2	5,554	100.0
599	Pietarsaari Pedersöre-	787	1.5	9,457	17.4	11,449	21.1	9,474	17.5	7,515	13.9	6,222	11.5	5,615	10.4	2,831	5.2	884	1.6	54,234	100.0
893	Nykarleby- Uusikaarlepyy	1,110	2.3	8,336	17.1	10,562	21.6	9,463	19.4	6,038	12.4	5,882	12.0	4,335	8.9	2,166	4.4	961	2.0	48,853	100.0
905	Vaasa-Vasa	37	0.4	1,949	19.5	2,121	21.2	1,108	11.1	1,250	12.5	1,882	18.8	1,242	12.4	202	2.0	216	2.2	10,008	100.0
945	Vörå-Maximo- Vöyri-	598	1.5	6,990	18.0	7,300	18.8	4,911	12.7	4,968	12.8	5,684	14.7	4,105	10.6	2,761	7.1	1,460	3.8	38,777	100.0
	Maksamaa	6,024	1.3	90,614	19.3	92,041	19.6	66,762	14.3	62,645	13.4	70,565	15.1	49,330	10.5	21,361	4.6	9,235	2.0	468,578	100.0
<b>Lounais-Suomi</b>																					
<i>Municipality</i>																					
6	Alastaro	229	1.9	1,726	14.5	1,911	16.0	2,345	19.7	1,890	15.8	1,848	15.5	1,155	9.7	663	5.6	163	1.4	11,929	100.0
17	Askainen	11	0.4	390	13.8	433	15.3	417	14.8	560	19.8	602	21.3	270	9.6	97	3.4	41	1.5	2,821	100.0
19	Aura	46	1.2	635	16.1	641	16.2	710	18.0	579	14.7	647	16.4	414	10.5	193	4.9	89	2.3	3,955	100.0
50	Eura	313	1.1	4,085	14.4	5,720	20.2	6,000	21.2	4,188	14.8	3,880	13.7	2,428	8.6	1,276	4.5	448	1.6	28,339	100.0
51	Eurajoki	311	1.4	3,314	15.3	4,857	22.5	4,555	21.1	2,990	13.8	2,941	13.6	1,579	7.3	835	3.9	231	1.1	21,612	100.0
73	Hailkko	50	0.3	2,449	13.7	3,650	20.4	2,869	16.0	3,832	21.4	2,713	15.1	1,497	8.4	615	3.4	256	1.4	17,931	100.0
79	Harjavalta	133	1.9	1,010	14.2	1,463	20.5	1,525	21.4	1,196	16.8	850	11.9	517	7.3	328	4.6	104	1.5	7,124	100.0
99	Honkaajoki	283	1.3	2,027	9.5	4,142	19.5	4,560	21.4	3,603	16.9	2,683	12.6	1,965	9.2	1,551	7.3	473	2.2	21,286	100.0
102	Huttinen	319	1.6	2,989	15.1	3,815	19.3	4,236	21.4	3,105	15.7	2,795	14.1	1,498	7.6	900	4.5	160	0.8	19,817	100.0
181	Jämijärvi	292	2.3	1,898	15.0	2,101	16.6	2,629	20.8	2,629	20.8	1,205	9.5	957	7.6	792	6.3	260	2.1	12,659	100.0
202	Kaarina	15	0.7	359	16.9	413	19.3	303	14.2	402	18.8	357	16.7	184	8.6	59	2.8	42	2.0	2,133	100.0
214	Kankaanaää	665	1.5	5,314	11.6	7,865	17.2	10,530	23.0	9,434	20.7	4,699	10.3	3,870	8.5	2,384	5.2	933	2.0	45,693	100.0
230	Karvia	474	1.5	2,768	8.6	6,114	19.1	6,614	20.6	5,050	15.7	5,003	15.6	2,821	8.8	2,600	8.1	643	2.0	32,087	100.0
252	Kiikala	189	1.3	1,881	13.4	2,147	15.3	2,449	17.5	2,277	16.2	2,476	17.6	1,485	10.6	778	5.6	353	2.5	14,036	100.0
259	Kiikomen	151	1.6	1,365	14.9	1,774	19.3	2,037	22.2	1,719	18.7	918	10.8	713	7.8	408	4.5	94	1.0	9,179	100.0
259	Kisko	147	0.9	2,349	13.9	2,884	17.1	3,047	18.0	3,010	17.8	2,608	15.4	1,625	9.6	793	4.7	435	2.6	16,899	100.0
262	Kiukainen	82	1.2	1,103	16.3	1,593	23.5	1,444	21.3	927	13.7	864	12.7	446	6.6	239	3.5	94	1.4	6,792	100.0
271	Kokemäki	484	1.7	4,289	14.9	5,763	20.0	6,247	21.7	4,995	17.4	3,408	11.8	1,904	6.6	1,239	4.3	445	1.6	28,774	100.0
284	Koski Tl	143	1.8	1,112	14.0	1,101	13.9	1,417	17.8	1,421	17.9	1,381	17.4	839	10.5	497	6.3	42	0.5	7,954	100.0
304	Kustavi	26	0.3	931	10.3	791	8.7	1,653	18.2	1,757	19.4	2,548	28.1	778	8.6	416	4.6	175	1.9	9,075	100.0
308	Kuusjoki	43	0.9	609	13.1	661	14.2	883	18.9	766	16.4	826	17.7	526	11.3	264	5.7	90	1.9	4,667	100.0
319	Köyliö	308	2.1	1,878	12.8	2,403	16.3	2,961	20.1	2,500	17.0	2,129	14.5	1,456	9.9	792	5.4	299	2.0	14,728	100.0
400	Laitila	291	0.9	4,294	13.2	6,197	19.1	6,837	21.1	4,697	14.5	4,909	15.1	3,175	9.8	1,595	4.9	425	1.3	32,419	100.0

(continued)

**Table 4a** (continued)

	Open regeneration site										121–140 years			141+ years			Forest land total				
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)			
406	Lappi	150	1.1	1,834	13.7	2,643	19.8	2,701	20.2	1,909	14.3	2,002	15.0	1,270	9.5	674	5.0	195	1.5	13,377	100.0
413	Lavia	418	1.8	3,178	13.8	4,644	20.2	5,109	22.2	4,357	18.9	2,126	9.2	1,748	7.6	1,040	4.5	415	1.8	23,035	100.0
419	Lemu	20	1.1	335	18.7	304	16.9	313	17.5	260	14.5	309	17.2	173	9.6	68	3.8	14	0.8	1,796	100.0
423	Lieto	69	0.8	1,196	13.5	1,393	15.7	1,610	18.2	1,462	16.5	1,507	17.0	950	10.7	448	5.1	214	2.4	8,849	100.0
430	Lorimaa	272	1.5	2,515	14.1	2,424	13.6	3,128	17.6	3,298	18.5	3,061	17.2	1,809	10.2	1,149	6.5	155	0.9	17,811	100.0
442	Luvia	174	1.5	1,504	12.7	2,937	24.7	2,634	22.2	1,553	13.1	1,384	11.7	801	6.7	707	6.0	188	1.6	11,884	100.0
480	Marttila	114	1.3	1,349	14.8	1,408	15.5	1,739	20.1	1,369	15.1	1,517	16.7	989	10.9	453	5.0	162	1.8	9,100	100.0
481	Maska	42	1.0	618	14.5	715	16.8	856	20.1	630	14.8	695	16.3	474	11.1	172	4.0	63	1.5	4,264	100.0
482	Mellilä	63	1.8	548	15.4	554	15.5	658	18.4	579	16.2	567	15.9	351	9.8	217	6.1	32	0.9	3,567	100.0
484	Merikarvia	614	1.9	5,667	17.5	6,954	21.4	6,156	19.0	6,149	21.0	2,946	9.1	2,277	7.0	1,011	3.1	672	2.1	32,445	100.0
485	Merimasku	4	0.1	271	10.2	269	10.1	429	16.1	568	21.4	697	26.2	259	9.8	115	4.3	46	1.8	2,657	100.0
501	Muurila	33	0.8	558	13.4	714	17.2	711	17.1	839	20.2	633	15.2	371	8.9	188	4.5	109	2.6	4,156	100.0
503	Mynämäki	428	1.4	4,527	14.5	5,695	18.2	6,628	21.2	4,596	14.7	4,360	14.0	3,059	9.8	1,424	4.6	524	1.7	31,242	100.0
529	Naantali	10	0.4	301	12.7	357	15.1	330	13.9	470	19.8	530	22.3	252	10.6	66	2.8	56	2.4	2,371	100.0
531	Nakkila	187	2.1	1,401	16.1	2,046	23.4	1,738	19.9	1,263	14.5	1,017	11.7	522	6.0	407	4.7	148	1.7	8,730	100.0
537	Noormarkku	412	1.7	4,106	16.8	4,357	17.8	4,661	19.1	4,037	16.5	2,824	11.6	2,079	8.5	1,418	5.8	527	2.2	24,421	100.0
538	Nousiainen	150	1.4	1,317	12.2	1,682	15.6	2,007	18.6	1,718	15.9	1,800	16.7	1,258	11.7	644	6.0	206	1.9	10,782	100.0
561	Oripää	87	1.6	721	13.0	829	14.9	1,123	20.2	851	15.3	836	15.1	598	10.8	356	6.4	157	2.8	5,558	100.0
577	Paimio	50	0.5	1,471	13.2	2,145	19.2	1,560	14.0	2,464	22.1	1,864	16.7	940	8.4	359	3.2	292	2.6	11,144	100.0
586	Perniö	161	0.7	2,662	11.5	3,850	16.7	3,969	17.2	5,051	21.9	3,540	15.3	2,219	9.6	976	4.2	691	3.0	23,117	100.0
587	Pertteli	53	0.8	950	14.3	1,072	16.2	1,198	18.1	1,152	17.4	1,059	16.0	643	9.7	334	5.0	165	2.5	6,626	100.0
602	Piikkiö	18	0.5	545	14.3	723	19.0	518	13.6	809	21.2	645	16.9	331	8.7	124	3.2	100	2.6	3,813	100.0
608	Pomarkku	291	1.3	2,814	12.4	3,557	15.7	4,211	18.6	4,328	19.1	3,242	14.3	2,292	10.1	1,437	6.3	534	2.4	22,706	100.0
609	Pori	547	1.9	5,795	20.5	6,246	22.1	5,425	19.2	3,172	11.2	2,876	10.2	2,021	7.2	1,533	5.4	604	2.1	28,219	100.0
631	Pyhäntä	59	0.6	1,258	13.1	1,669	17.4	2,006	20.9	1,577	16.5	1,359	14.2	1,058	11.0	545	5.7	52	0.5	9,582	100.0
636	Pöytyä	266	1.3	2,851	13.9	3,347	16.3	3,969	19.3	3,133	15.3	3,140	15.3	2,198	10.7	1,076	5.2	545	2.7	20,526	100.0
680	Raisio	18	1.0	309	16.7	315	17.0	294	15.9	329	17.8	330	17.8	177	9.6	51	2.8	28	1.5	1,852	100.0
684	Rauma	123	0.7	2,524	14.1	3,619	20.2	3,642	20.3	2,686	15.0	2,542	14.2	1,751	9.8	868	4.9	149	0.8	17,904	100.0
704	Rusko	22	1.0	318	14.1	365	16.1	477	21.1	346	15.3	378	16.7	249	11.0	81	3.6	26	1.1	2,262	100.0
705	Rymättylä	18	0.3	719	10.0	694	9.7	1,013	14.1	1,478	20.6	1,967	27.5	743	10.4	265	3.7	266	3.7	7,163	100.0
734	Salo	54	0.7	1,133	15.3	1,394	18.8	1,276	17.2	1,453	19.6	1,014	13.7	633	8.6	279	3.8	168	2.3	7,403	100.0
738	Sauvo	101	0.8	1,927	16.1	2,298	19.2	1,862	15.6	2,042	17.1	2,028	17.0	1,092	9.1	432	3.6	165	1.4	11,946	100.0
747	Siikainen	628	1.9	5,103	15.0	6,219	18.6	7,496	22.1	7,157	21.1	3,127	9.2	2,282	6.7	1,087	3.2	732	2.2	33,928	100.0
761	Somero	382	1.2	5,060	15.3	5,602	16.9	6,392	19.3	5,485	16.5	5,446	16.4	2,869	8.7	1,581	4.8	358	1.1	33,174	100.0
776	Suomusjärvi	155	1.4	1,814	16.6	1,853	17.0	1,867	17.1	1,719	15.7	1,792	16.4	1,091	10.0	489	4.5	148	1.4	10,927	100.0
783	Säkylä	179	1.9	1,142	11.8	1,478	15.3	1,905	17.8	1,589	16.5	1,525	15.8	1,027	10.7	589	6.1	211	2.2	9,646	100.0
784	Särkisalo-Finby	23	0.4	739	13.9	1,018	19.2	885	16.7	1,031	19.4	868	16.3	490	9.2	201	3.8	60	1.1	5,314	100.0

833	Täivassalo	17	0.3	725	11.7	697	11.2	957	15.4	1,283	20.6	1,549	24.9	639	10.3	258	4.2	91	1.5	6,217	100.0
838	Tarvasjoki	40	0.9	661	15.2	753	17.3	834	19.1	677	15.5	691	15.9	421	9.7	201	4.6	79	1.8	4,357	100.0
856	Turku-Abo	87	1.0	1,479	16.8	1,381	15,542	1,478	16.8	1,381	15.7	1,511	17.2	869	9.9	272	3.1	181	2.1	8,802	100.0
886	Ulvila	545	2.0	3,999	14.6	5,622	20.5	5,798	21.2	4,666	17.1	2,891	10.6	1,972	7.2	1,369	5.0	500	1.8	27,364	100.0
895	Uusikaupunki	376	1.3	4,670	16.4	5,551	19.5	5,163	18.2	4,029	14.2	4,168	14.7	2,931	10.3	1,337	4.7	186	0.7	28,411	100.0
906	Vahto	55	1.3	525	12.6	688	16.5	804	19.3	682	16.3	655	15.7	434	10.4	253	6.1	80	1.9	4,177	100.0
913	Vampula	114	1.7	934	13.9	1,084	16.1	1,523	22.6	1,009	15.0	1,084	16.1	599	8.9	285	4.2	100	1.5	6,733	100.0
918	Vehmaa	72	0.8	1,600	17.5	1,862	20.3	1,503	16.4	1,471	16.1	1,420	15.5	865	9.4	306	3.3	67	0.7	9,167	100.0
920	Velkua	3	0.2	147	8.7	81	4.8	300	17.8	323	3.3	518	30.7	170	10.1	76	4.5	67	4.0	1,684	100.0
979	Yläne	280	1.2	2,948	12.4	4,019	16.9	4,771	20.1	3,953	16.6	3,551	14.9	2,441	10.3	1,291	5.4	507	2.1	23,763	100.0
Total		12,984	1.32	137,54	14.12	177,82	18.27	191,78	19.78	165,90	17.07	137,87	14.12	86,79	8.93	47,83	4.92	17,33	1.88	975,87	100.0
<b>Häme-Uusimaa</b>																					
<i>Municipality</i>																					
15	Arjajärvi	14	0.2	1,800	19.0	1,900	20.1	1,172	12.4	1,380	14.6	1,605	17.0	957	10.1	329	3.5	297	3.1	9,454	100.0
16	Asikkala	157	0.4	7,660	17.8	8,261	19.2	7,541	17.5	8,511	19.8	5,670	13.2	3,489	8.1	932	2.2	779	1.8	43,000	100.0
18	Askola	164	1.4	1,603	13.2	1,921	15.8	1,964	16.2	2,072	17.0	2,391	19.7	1,361	11.2	511	4.2	172	1.4	12,160	100.0
61	Forssa	129	0.9	2,470	18.0	1,893	13.8	2,301	16.7	2,854	20.8	2,424	17.6	848	6.2	733	5.3	100	0.7	13,752	100.0
82	Hartola	109	0.3	9,112	20.7	9,475	21.6	7,601	17.3	9,216	21.0	4,594	10.5	2,557	5.8	998	2.3	281	0.6	43,942	100.0
83	Hattula	356	1.4	4,582	18.1	5,932	23.4	3,418	13.5	5,454	21.5	3,251	12.8	1,702	6.7	349	1.4	277	1.1	25,321	100.0
86	Hautio	371	1.5	3,309	13.5	3,762	15.3	4,553	18.5	6,564	26.7	2,952	12.0	2,326	9.5	507	2.1	232	0.9	24,577	100.0
87	Hausjärvi	255	1.3	3,144	15.7	3,611	18.0	3,871	19.3	3,920	19.5	2,865	14.3	1,779	8.9	425	2.1	197	1.0	20,066	100.0
98	Hollola	328	1.1	5,687	19.1	6,512	21.9	5,046	17.0	5,044	17.0	3,598	12.1	2,515	8.5	613	2.1	371	1.3	29,714	100.0
103	Humppila	91	1.3	956	13.3	806	11.2	1,609	22.4	1,608	22.4	816	11.4	639	8.9	631	8.8	28	0.4	7,185	100.0
106	Hyvinkää	189	1.0	3,138	16.1	2,974	15.3	3,695	19.0	4,140	21.3	3,004	15.5	1,570	8.1	490	2.5	243	1.3	19,441	100.0
109	Hämeenlinna	122	1.1	2,117	19.7	2,410	22.5	1,805	16.8	2,014	18.8	1,295	12.1	589	5.5	270	2.5	110	1.0	10,732	100.0
111	Heinola	116	0.2	9,834	17.3	10,643	25.8	6,858	12.1	11,394	20.0	4,810	8.5	4,481	7.9	3,285	5.8	1,440	2.5	56,862	100.0
165	Janakkala	552	1.6	5,264	15.7	5,940	17.7	6,659	19.8	6,642	19.8	4,777	14.2	2,375	7.1	981	2.9	403	2.2	33,594	100.0
169	Jokioinen	104	1.3	1,334	16.6	1,070	13.3	1,462	18.2	1,567	19.5	1,448	18.1	498	6.2	509	6.4	29	0.4	8,022	100.0
216	Järvenpää	23	1.5	458	30.6	216	14.5	331	22.1	204	13.6	138	9.3	88	5.9	31	2.1	8	0.5	1,497	100.0
280	Kalvola	230	1.0	4,043	18.1	5,724	25.7	2,764	12.4	4,292	19.2	3,070	13.8	1,580	7.1	322	1.4	294	1.3	22,318	100.0
223	Karjalohja	155	2.0	1,717	22.6	1,539	20.2	1,406	18.5	875	11.5	1,002	13.2	463	6.1	378	5.0	78	1.0	7,612	100.0
224	Karkkila	88	0.5	2,669	16.5	2,821	17.4	2,955	18.2	3,095	19.1	2,629	16.2	1,304	8.1	428	2.6	217	1.3	16,205	100.0
245	Kerava	6	0.4	425	29.1	214	14.7	349	23.9	178	12.2	149	10.2	87	5.9	39	2.7	12	0.9	1,459	100.0
283	Hämeenkoski	145	1.2	2,050	17.2	2,574	21.6	2,628	22.0	2,270	19.0	1,157	9.7	779	6.5	175	1.5	149	1.3	11,927	100.0
316	Kärkölä	150	1.1	2,052	15.1	2,907	21.4	2,604	19.1	2,613	19.2	1,730	12.7	1,178	8.7	269	2.0	104	0.8	13,607	100.0
398	Lahti	19	0.2	1,970	24.9	1,875	23.7	1,041	13.1	1,065	13.4	1,000	12.6	688	8.7	170	2.2	93	1.2	7,922	100.0
401	Lammi	496	1.3	6,280	16.0	7,794	19.9	8,389	21.4	7,920	20.2	3,816	9.7	3,007	7.7	865	2.2	677	1.7	39,244	100.0
433	Loppi	334	0.8	6,452	15.5	7,195	17.3	6,753	16.3	8,965	21.6	7,081	17.0	3,234	7.8	1,105	2.7	442	1.1	41,559	100.0
444	Lohja-Lojo	125	0.8	3,507	21.7	2,938	18.2	3,259	20.1	2,110	13.0	2,201	13.6	1,290	8.0	560	3.5	193	1.2	16,183	100.0

(continued)

**Table 4a** (continued)

	Open regene- ration site		1–20 years		21–40 years		41–60 years		61–80 years		81–100 years		101–120 years		121–140 years		141+ years		Forest land total		
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
504 Myrskylä- Mörskom	88	0.7	1,900	15.4	2,286	18.5	1,878	15.2	2,006	16.2	2,236	18.1	1,276	10.3	466	3.8	229	1.9	12,366	100.0	
505 Mäntsälä	395	1.2	4,342	13.0	5,234	15.7	6,537	19.6	7,190	21.6	5,152	15.5	3,548	10.6	761	2.3	173	0.5	33,332	100.0	
532 Nastola	151	0.7	5,209	23.0	4,691	20.7	2,599	11.3	3,931	17.3	3,007	13.3	2,149	9.5	618	2.7	348	1.5	22,673	100.0	
540 Nummi-Pusula	270	0.9	6,183	20.9	6,007	20.3	6,269	21.3	4,072	13.8	3,831	13.0	1,788	6.1	802	2.7	307	1.0	29,559	100.0	
543 Nurmijärvi	47	0.3	3,581	20.1	3,195	17.9	3,576	20.1	3,627	20.3	2,133	12.0	1,109	6.2	308	1.7	258	1.5	17,836	100.0	
560 Orimattila	235	0.7	7,581	21.8	6,969	20.0	4,400	12.6	5,124	14.7	5,277	15.2	3,779	10.9	939	2.7	498	1.4	34,803	100.0	
576 Padasjoki	241	0.5	6,902	15.5	7,640	17.2	7,050	15.9	9,169	20.6	6,994	15.8	4,224	9.5	1,114	2.5	1,086	2.4	44,419	100.0	
611 Pornainen	137	1.6	1,520	17.8	1,364	16.0	1,668	19.6	1,444	16.9	1,194	14.0	855	10.0	256	3.0	85	1.0	8,523	100.0	
616 Pukkila	90	1.2	1,504	20.2	1,479	19.8	1,194	16.0	1,017	13.6	1,099	14.7	774	10.4	261	3.5	45	0.6	7,463	100.0	
692 Renko	109	0.6	2,964	15.7	3,647	19.3	2,499	13.2	4,151	22.0	3,192	16.9	1,645	8.7	472	2.5	200	1.1	18,879	100.0	
694 Riihimäki	64	1.0	1,275	19.0	1,054	15.7	1,249	18.6	1,338	19.9	1,105	16.5	426	6.3	148	2.2	60	0.9	6,719	100.0	
737 Sammatti	101	2.3	1,071	23.9	930	20.8	838	18.7	528	11.8	533	11.9	232	5.2	205	4.6	38	0.9	4,475	100.0	
781 Sysmä	205	0.4	9,562	18.3	10,331	19.8	10,287	19.7	11,375	21.8	5,548	10.6	2,958	5.7	1,149	2.2	819	1.6	52,235	100.0	
834 Tammela	215	0.5	6,795	15.5	7,739	17.7	7,780	17.8	8,811	20.1	7,335	16.8	3,247	7.4	1,281	2.9	574	1.3	43,777	100.0	
855 Tuulos	214	1.8	2,004	16.7	2,015	16.8	2,540	21.2	2,654	22.1	1,103	9.2	966	8.1	320	2.7	182	1.5	11,998	100.0	
858 Tuusula	88	0.8	2,347	22.2	1,722	16.3	2,439	23.1	1,757	16.7	1,176	11.1	747	7.1	199	1.9	78	0.7	10,554	100.0	
927 Vihti	61	0.2	5,132	16.0	6,210	19.4	6,354	19.9	6,011	18.8	4,346	13.6	2,471	7.7	691	2.2	732	2.3	32,009	100.0	
981 Ypäjä	62	0.8	1,104	13.9	884	11.2	1,713	21.6	1,645	20.8	1,406	17.7	479	6.1	609	7.7	23	0.3	7,925	100.0	
Total	7,601	0.8	164,611	17.6	180,307	19.3	162,902	17.4	181,815	19.4	126,140	13.5	74,058	7.9	26,504	2.8	12,961	1.4	936,899	100.0	
<b>Kaakkoi-Suomi</b>																					
<i>Municipality</i>																					
44 Elimäki	243	1.3	3,637	18.7	3,665	18.9	3,403	17.5	2,973	15.3	2,691	13.8	1,983	10.2	514	2.6	330	1.7	19,440	100.0	
75 Hamina	485	1.1	7,952	18.2	10,454	23.9	7,518	17.2	6,245	14.3	5,301	12.1	3,607	8.2	1,359	3.1	848	1.9	43,769	100.0	
142 Iti	404	1.0	8,013	20.3	8,946	22.7	6,698	17.0	5,637	14.3	4,756	12.1	3,351	8.5	958	2.4	699	1.8	39,462	100.0	
153 Imatra	156	1.6	1,872	19.6	2,449	25.6	1,613	16.9	1,496	15.6	1,248	13.0	553	5.8	110	1.2	67	0.7	9,564	100.0	
163 Jaala	169	0.5	6,110	17.6	8,627	24.8	5,535	15.9	5,130	14.8	4,173	12.0	2,962	8.5	1,406	4.0	664	1.9	34,776	100.0	
173 Joutseno	315	1.6	3,500	17.4	5,001	24.8	3,551	17.6	3,261	16.2	2,832	14.1	1,250	6.2	264	1.3	174	0.9	20,147	100.0	
285 Kotka	217	1.2	3,879	21.6	3,838	21.4	2,859	15.9	2,746	15.3	2,182	12.2	1,263	7.0	517	2.9	429	2.4	17,930	100.0	
286 Kouvolaa	30	1.4	576	27.2	522	24.6	360	17.0	232	10.9	209	9.8	114	5.4	55	2.6	25	1.2	2,121	100.0	
306 Kuusankoski	61	0.9	1,498	21.9	1,681	24.6	1,213	17.7	947	13.8	760	11.1	437	6.4	153	2.2	98	1.4	6,847	100.0	
405 Lappeenranta	638	1.2	10,339	19.3	12,206	22.7	9,247	17.2	8,689	16.2	7,356	13.7	3,816	7.1	1,011	1.9	407	0.8	53,707	100.0	
416 Lemmi	144	0.9	3,059	19.3	3,444	21.8	2,701	17.1	2,523	16.0	2,302	14.6	1,103	7.0	393	2.5	154	1.0	15,824	100.0	
441 Luumäki	471	0.8	9,324	15.9	13,558	23.1	11,336	19.3	10,016	17.0	8,123	13.8	4,201	7.2	1,230	2.1	505	0.9	58,765	100.0	
489 Miehikkälä	287	0.9	5,376	16.9	8,946	28.2	6,069	19.1	4,573	14.4	3,367	10.6	2,413	7.6	615	1.9	140	0.4	31,786	100.0	
580 Parikkala	597	1.4	11,200	26.6	12,347	29.4	5,205	12.4	5,092	12.1	4,449	10.6	2,222	5.3	496	1.2	425	1.0	42,033	100.0	

624	Pyhtää-Pyttis	204	1.0	3,682	18.1	4,302	21.2	3,507	17.3	3,640	17.9	2,725	13.4	1,164	5.7	701	3.5	405	2.0	20,329	100.0
689	Rautjärvi	381	1.4	5,640	20.1	7,169	25.6	4,334	15.5	4,201	15.0	3,738	13.4	1,785	6.4	473	1.7	283	1.0	28,004	100.0
700	Ruokolahti	756	1.0	13,276	16.9	21,065	26.7	13,832	17.6	10,941	13.9	10,480	13.9	5,910	7.5	1,567	2.0	938	1.2	78,786	100.0
739	Savitaipale	175	0.4	6,186	14.8	10,376	24.8	7,151	17.1	5,867	14.0	6,655	15.3	3,720	8.9	1,304	3.1	384	0.9	41,818	100.0
754	Anjalankoski	461	1.0	8,400	17.5	11,260	23.4	8,666	18.0	7,341	15.3	5,862	12.2	3,702	7.7	1,539	3.2	829	1.7	48,060	100.0
775	Suomenniemi	224	0.9	4,116	17.0	5,970	24.6	3,086	12.7	3,078	12.7	4,131	17.0	2,736	11.3	709	2.9	403	0.8	24,254	100.0
831	Taipalsaari	237	0.9	4,258	15.4	6,922	25.1	4,579	16.6	4,368	15.8	4,129	15.0	2,087	7.6	618	2.2	423	1.5	27,621	100.0
909	Valklea	447	0.7	11,163	17.6	15,696	24.7	11,222	17.7	9,454	14.9	7,874	12.4	4,750	7.5	1,882	3.0	1,029	1.6	63,518	100.0
935	Virrolahti	383	1.5	5,605	21.2	7,296	27.6	3,316	16.4	3,316	12.6	2,679	10.1	1,917	7.3	650	2.5	238	0.9	26,409	100.0
978	Ylämaa	303	1.0	5,065	16.6	8,624	28.3	5,858	19.2	4,590	15.1	3,145	10.3	2,252	7.4	502	1.7	104	0.3	30,442	100.0
	Total	7,787	1.0	143,726	18.3	194,366	24.8	133,867	17.0	116,357	14.8	101,167	12.9	59,297	7.6	19,024	2.4	9,821	1.3	785,412	100.0

### Pirkkamaa

<i>Municipality</i>																					
20	Akaa	78	1.4	1,218	22.2	1,196	21.8	1,078	19.6	805	14.6	590	10.7	337	6.1	136	2.5	59	1.1	5,498	100.0
108	Hämeenkyrö	271	0.9	5,098	16.0	7,397	23.3	6,321	19.9	4,914	15.5	3,959	12.5	2,322	7.3	1,110	3.5	385	1.2	31,776	100.0
143	Ikaalinen	799	1.4	8,361	15.0	11,849	21.3	10,512	18.9	8,707	15.7	7,118	12.8	4,520	8.1	2,717	4.9	1,067	1.9	55,650	100.0
177	Juupajoki	252	1.3	3,341	16.6	3,732	18.6	3,744	18.6	3,477	17.3	2,706	13.5	1,698	8.4	777	3.9	392	2.0	20,120	100.0
211	Kangasala	356	1.0	6,435	18.3	7,782	22.1	6,844	19.5	5,598	15.9	3,765	10.7	2,881	8.2	1,118	3.2	387	1.1	35,165	100.0
250	Kihniö	195	0.7	2,330	8.7	5,717	21.2	5,806	21.5	4,704	17.5	3,219	12.0	2,791	10.4	1,199	4.5	989	3.7	26,950	100.0
289	Kuhmalampi	121	0.9	1,927	14.9	2,709	20.9	2,551	19.7	2,291	17.7	1,621	12.5	1,115	8.6	493	3.8	143	1.1	12,971	100.0
303	Kuru	501	0.8	6,827	11.5	12,925	21.8	11,857	20.0	9,513	16.0	8,051	13.6	5,583	9.4	2,753	4.6	1,298	2.2	59,309	100.0
310	Kylmäkoski	136	1.2	1,897	16.3	2,268	19.5	2,236	19.2	2,112	18.2	1,551	13.3	887	7.6	374	3.2	175	1.5	11,637	100.0
418	Lempäälä	174	0.9	3,203	16.9	4,187	22.2	3,769	19.9	2,993	15.8	2,268	12.0	1,581	8.4	558	3.0	169	0.9	18,902	100.0
493	Mouhijärvi	178	1.0	3,069	17.3	4,440	25.0	3,301	18.6	2,512	14.1	2,104	11.8	1,270	7.1	692	3.9	220	1.2	17,786	100.0
506	Mänttä	26	0.6	761	16.5	955	20.7	933	20.2	790	17.1	587	12.7	352	7.6	138	3.0	75	1.6	4,617	100.0
536	Nokia	195	0.9	3,722	18.0	4,973	24.0	3,868	18.7	2,924	14.1	2,577	12.4	1,540	7.4	689	3.3	239	1.2	20,725	100.0
562	Orivesi	651	1.1	10,684	17.2	12,930	20.8	11,723	18.9	9,867	15.9	7,620	12.3	5,517	8.9	2,245	3.6	942	1.5	62,179	100.0
581	Parkano	741	1.2	7,813	12.4	12,441	19.7	11,830	18.7	10,671	16.9	8,379	13.3	6,575	10.4	3,111	4.9	1,616	2.6	63,177	100.0
604	Pirkkala	55	1.0	1,101	20.2	1,248	22.8	1,041	19.1	786	14.4	661	12.1	372	6.8	158	2.9	43	0.8	5,466	100.0
619	Punkalaidun	288	1.5	2,513	13.3	2,734	14.5	3,375	17.9	3,520	18.6	3,279	17.3	1,915	10.1	1,167	6.2	122	0.7	18,914	100.0
635	Pälkäne	240	0.6	5,919	14.1	8,107	19.3	8,811	21.0	8,524	20.3	5,071	12.1	3,474	8.3	1,418	3.4	394	0.9	41,958	100.0
702	Ruovesi	608	1.0	8,077	13.0	11,950	19.3	12,266	19.8	10,464	16.9	8,703	14.0	5,678	9.2	2,825	4.6	1,433	2.3	62,002	100.0
837	Tampere	337	0.9	5,743	15.4	8,204	22.1	6,978	18.8	5,974	16.1	4,673	12.6	3,258	8.8	1,449	3.9	570	1.5	37,188	100.0
887	Urijala	318	1.0	4,983	16.0	5,796	18.6	5,777	18.6	6,032	19.4	4,297	13.8	2,313	7.4	1,115	3.6	469	1.5	31,101	100.0
908	Valkeakoski	166	1.0	3,239	18.5	3,717	21.3	3,650	20.8	2,995	17.2	1,888	10.8	1,259	7.2	413	2.4	162	0.9	17,468	100.0
912	Vammala	665	1.2	9,343	16.6	13,174	23.4	10,150	18.0	8,395	14.9	6,890	12.3	4,382	7.8	2,518	4.5	751	1.3	56,268	100.0
922	Vesilampi	275	1.3	3,433	16.0	3,859	18.0	3,647	17.0	3,641	17.0	3,081	14.4	2,167	10.1	1,018	4.8	314	1.5	21,435	100.0
933	Vilppula	410	1.1	5,784	15.2	7,368	19.4	7,081	18.6	6,359	16.7	5,260	13.8	3,509	9.2	1,471	3.9	794	2.1	38,037	100.0
936	Virrat	976	1.1	12,996	14.2	19,339	21.2	17,496	19.2	14,210	15.6	10,521	11.5	8,980	9.8	4,287	4.7	2,442	2.7	91,247	100.0
980	Ylöjärvi	329	1.1	4,847	16.7	6,640	22.8	5,294	18.2	4,467	15.4	3,569	12.3	2,371	8.2	1,167	4.0	407	1.4	29,092	100.0
988	Aetsä	275	1.7	2,999	18.6	3,920	24.3	2,752	17.0	2,197	13.6	1,886	11.7	1,156	7.2	762	4.7	201	1.3	16,149	100.0
	Total	9,617	1.1	137,663	15.1	191,559	21.0	174,671	19.1	149,443	16.4	115,894	12.7	79,803	8.7	37,877	4.2	16,260	1.8	912,787	100.0

(continued)

**Table 4a** (continued)

		Open regeneration site										121–140 years		141+ years		Forest land total						
		(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)					
<b>Etelä-Savo Municipality</b>																						
46	Enonkoski	515	1.8	6,798	23.8	6,908	24.2	3,518	12.3	3,802	13.3	3,082	10.8	2,009	7.0	1,142	4.0	783	2.7	28,556	100.0	
90	Heinävesi	1,045	1.1	22,259	23.5	27,578	29.1	14,324	15.1	9,407	9.9	10,828	11.4	5,288	5.6	1,929	2.0	2,193	2.3	94,851	100.0	
97	Hirvensalmi	451	1.1	8,619	21.5	10,027	25.0	5,246	13.1	5,716	14.3	6,007	15.0	2,912	7.3	712	1.8	431	1.1	40,121	100.0	
171	Joroinen	722	1.6	10,170	22.1	10,080	21.9	6,593	14.3	6,975	15.2	6,209	13.5	3,435	7.5	1,323	2.9	465	1.0	45,972	100.0	
178	Juva	1,573	1.6	19,191	19.4	22,155	22.4	15,142	15.3	16,255	16.5	13,508	13.7	7,356	7.5	2,544	2.6	1,027	1.0	98,751	100.0	
213	Kangasniemi	1,665	1.8	18,579	20.3	20,369	22.3	12,252	13.4	13,497	14.8	14,194	15.5	7,075	7.8	2,820	3.1	886	1.0	91,338	100.0	
246	Kerimäki	870	1.8	11,360	23.0	12,838	25.9	6,558	13.3	6,812	13.8	5,999	12.1	3,644	7.4	971	2.0	444	0.9	49,494	100.0	
491	Mikkeli	2,208	1.6	29,308	20.7	32,145	22.7	20,370	14.4	21,466	15.1	21,233	15.0	10,373	7.3	3,683	2.6	963	0.7	141,769	100.0	
507	Mäntyharju	1,242	1.5	20,117	23.8	22,863	27.0	11,372	13.4	9,657	11.4	10,261	12.1	6,066	7.2	2,136	2.5	919	1.1	84,632	100.0	
588	Pertunmaa	392	1.2	8,046	25.2	7,540	23.6	4,064	12.7	5,461	17.1	4,232	13.2	1,774	5.6	371	1.2	73	0.2	31,954	100.0	
593	Pieksämäki	2,196	1.6	29,701	22.2	30,967	23.1	16,857	12.6	18,783	14.0	18,209	13.6	10,673	8.0	4,781	3.6	1,714	1.3	133,880	100.0	
618	Punkaharju	825	1.9	9,598	22.3	9,873	22.9	6,112	14.2	5,770	13.4	5,243	12.2	4,202	9.8	864	2.0	578	1.3	43,065	100.0	
623	Puumala	670	0.9	11,568	16.3	19,682	27.7	9,141	12.9	11,423	16.1	11,451	16.1	4,504	6.3	1,573	2.2	1,024	1.4	71,036	100.0	
681	Rantasalmi	844	1.8	12,215	26.5	11,018	23.9	6,587	14.3	5,880	12.7	5,549	12.0	2,705	5.9	972	2.1	409	0.9	46,178	100.0	
696	Ristina	645	1.3	9,759	20.1	12,088	24.9	7,145	14.7	6,887	14.2	7,137	14.7	3,393	7.0	1,059	2.2	432	0.9	48,545	100.0	
740	Savonlinna	887	1.3	15,114	21.4	19,918	28.2	10,273	14.5	9,904	14.0	8,102	11.5	4,324	6.1	1,642	2.3	475	0.7	70,641	100.0	
741	Savonranta	616	1.8	7,036	20.3	10,302	29.7	4,330	12.5	4,210	12.1	4,067	11.7	2,053	5.9	1,076	3.1	1,021	2.9	34,710	100.0	
768	Sulkava	824	1.6	11,193	22.0	13,570	26.7	7,714	15.2	7,097	14.0	5,337	10.5	3,605	7.1	1,012	2.0	426	0.8	50,778	100.0	
	Total	18,189	1.5	260,632	21.6	299,919	24.9	167,619	13.9	169,002	14.0	160,647	13.3	85,390	7.1	30,611	2.5	14,263	1.2	1,206,273	100.0	
<b>Etelä-Pohjanmaa Municipality</b>																						
4	Alahärmä	395	2.1	3,805	20.2	3,656	19.4	2,965	15.7	2,261	12.0	2,566	13.6	2,087	11.1	914	4.8	221	1.2	18,868	100.0	
5	Alajärvi	566	1.1	6,427	12.6	9,458	18.6	10,311	20.3	8,991	17.7	7,027	13.8	5,261	10.4	2,250	4.4	557	1.1	50,848	100.0	
10	Alavus	627	1.2	6,622	12.5	9,722	18.3	10,129	19.1	9,329	17.6	7,053	13.3	6,383	12.0	2,691	5.1	613	1.2	53,169	100.0	
52	Evijärvi	346	1.4	4,415	17.8	4,898	19.8	3,589	14.5	4,606	18.6	2,820	11.4	2,223	9.0	1,523	6.2	356	1.4	24,776	100.0	
74	Halsua	116	0.4	2,891	10.5	6,921	25.1	8,974	32.5	4,057	14.7	2,094	7.6	1,222	4.4	759	2.8	580	2.1	27,614	100.0	
95	Himanka	98	0.6	2,265	13.6	2,965	17.8	3,045	18.3	3,078	18.5	2,476	14.9	1,761	10.6	728	4.4	229	1.4	16,645	100.0	
145	Ilmajoki	815	2.3	4,585	13.2	5,516	15.8	4,312	12.4	4,821	13.8	6,275	19.3	4,301	12.3	3,413	9.8	370	1.1	34,858	100.0	
151	Isajoki	323	0.7	4,071	8.7	9,897	21.2	7,451	15.9	7,960	17.0	7,864	16.8	5,771	12.3	2,875	6.2	559	1.2	46,773	100.0	
152	Isokyrö	401	2.1	3,181	16.7	3,895	20.4	3,037	15.9	2,494	13.1	2,553	13.4	1,549	8.1	1,425	7.5	526	2.8	19,061	100.0	
164	Jalasjärvi	656	1.3	6,689	13.2	9,270	18.4	9,380	18.6	7,718	15.3	7,312	14.5	5,425	10.7	3,389	6.7	690	1.4	50,529	100.0	
175	Jurva	372	1.2	4,496	14.4	4,816	15.4	3,893	12.5	5,810	18.6	5,380	17.2	4,345	13.9	1,655	5.3	455	1.5	31,221	100.0	

217	Kannus	202	0.7	4,092	14.5	5,340	18.9	5,474	19.4	5,171	18.3	4,473	15.8	2,240	7.9	1,026	3.6	277	1.0	28,294	100.0
218	Karjoki	155	1.3	1,510	12.5	2,338	19.3	1,598	13.2	1,918	15.9	1,886	15.6	1,684	13.9	719	5.9	291	2.4	12,098	100.0
232	Kauhajoki	1,013	1.2	10,592	12.8	20,934	25.3	14,299	17.3	12,215	14.8	10,088	12.7	7,518	9.1	5,112	6.2	874	1.1	82,645	100.0
233	Kauhava	429	1.5	4,679	16.4	5,499	19.3	3,767	13.2	5,208	18.3	4,138	14.5	2,545	8.9	1,745	6.1	491	1.7	28,501	100.0
236	Kausainen	174	0.8	2,971	12.8	5,302	22.9	4,499	19.4	4,522	19.5	2,943	12.7	1,551	6.7	910	3.9	330	1.4	23,201	100.0
281	Kortesjärvi	349	1.6	3,993	18.0	4,527	20.4	3,214	14.5	3,578	16.1	3,099	14.0	1,821	8.2	1,293	5.8	332	1.5	22,206	100.0
300	Kuortane	412	1.3	4,616	14.6	5,563	17.6	3,788	12.0	5,528	17.5	4,756	15.1	4,183	13.2	2,164	6.9	578	1.8	31,586	100.0
301	Kurikka	699	2.6	4,315	15.8	4,268	15.7	3,547	13.0	3,812	14.0	4,463	16.4	3,611	13.2	2,093	7.7	472	1.7	27,280	100.0
315	Kälviä	290	0.6	5,669	12.6	9,799	21.7	8,350	18.5	7,980	17.7	6,266	13.9	3,975	8.8	1,789	4.0	968	2.2	45,085	100.0
399	Laihia	543	1.7	5,013	15.4	6,064	18.6	4,679	14.4	5,193	15.9	4,994	15.3	3,860	11.8	1,550	4.8	699	2.2	32,596	100.0
403	Lappajärvi	345	1.2	3,620	12.6	5,409	18.8	4,733	16.5	6,244	21.7	4,097	14.2	2,530	8.8	1,328	4.6	464	1.6	28,770	100.0
408	Lapua	535	1.3	5,877	13.8	8,368	19.6	6,387	14.9	7,562	17.7	5,687	13.3	4,511	10.6	3,098	7.3	731	1.7	42,756	100.0
414	Lehtimäki	190	1.1	2,374	13.1	2,648	14.7	2,707	15.0	3,386	18.7	3,224	17.8	2,623	14.5	756	4.2	162	0.9	18,070	100.0
421	Lestijärvi	299	0.9	4,252	12.8	7,100	21.4	7,714	23.2	5,849	17.6	3,472	10.5	2,097	6.3	1,389	4.2	1,030	3.1	33,203	100.0
429	Lohtaja	374	1.3	4,826	16.7	6,004	20.8	4,604	15.9	4,377	15.1	4,439	15.4	2,630	9.1	1,294	4.5	356	1.2	28,904	100.0
544	Lurmo	425	1.8	3,501	15.1	4,086	17.6	3,502	15.1	4,220	18.2	3,057	13.2	2,386	10.3	1,666	7.2	345	1.5	23,187	100.0
584	Perho	103	0.2	6,842	12.9	6,455	31.1	17,857	33.7	4,602	8.7	3,560	6.7	2,227	4.2	708	1.3	643	1.5	52,997	100.0
743	Seinäjoki	561	1.6	4,699	13.5	6,699	19.3	6,905	19.9	5,698	16.4	4,480	12.9	3,177	9.2	2,090	6.0	385	1.1	34,695	100.0
759	Soini	402	1.0	4,702	11.6	7,964	19.6	8,491	20.9	7,467	18.4	5,218	12.9	4,378	10.8	1,478	3.6	469	1.2	40,570	100.0
846	Teuva	486	1.4	4,884	13.6	6,004	16.7	4,499	12.5	6,546	18.2	6,233	17.4	4,622	12.9	1,924	5.4	680	1.9	35,878	100.0
849	Toholampi	263	0.7	4,466	12.4	7,086	19.6	7,593	21.0	7,576	21.0	4,529	12.5	2,884	8.0	1,035	2.9	699	1.9	36,130	100.0
863	Töyvä	294	1.4	2,956	13.9	4,022	18.9	2,950	13.8	3,496	16.4	3,362	15.8	2,515	11.8	1,320	6.2	400	1.9	21,314	100.0
885	Ullava	70	0.7	1,048	9.8	2,017	18.8	2,327	21.7	2,378	22.1	1,382	12.9	800	7.5	471	4.4	246	2.3	10,740	100.0
924	Veteli	312	1.0	3,749	11.4	6,700	20.4	7,306	22.3	7,291	22.2	3,519	10.7	1,866	5.7	1,709	5.2	340	1.0	32,791	100.0
934	Vimpeli	235	1.3	2,263	12.0	3,891	20.6	4,195	22.2	3,702	19.6	2,038	10.8	1,452	7.7	880	4.7	213	1.1	18,871	100.0
942	Vähäkylä	159	1.8	2,245	25.2	1,614	18.1	819	9.2	1,162	13.1	1,061	11.9	1,011	11.4	415	4.7	413	4.6	8,897	100.0
971	Ylhäelmä	125	1.8	1,269	18.6	1,134	16.6	1,183	17.4	734	10.8	929	13.6	863	12.7	463	6.8	121	1.8	6,822	100.0
975	Yhdistaro	697	2.5	4,341	15.6	5,662	20.4	3,728	13.4	3,403	12.2	4,489	16.2	2,642	9.5	2,093	7.5	749	2.7	27,805	100.0
989	Ahtäri	748	1.2	9,839	15.4	13,566	21.2	10,580	16.5	10,405	16.3	8,892	13.9	5,799	9.1	3,142	4.9	1,022	1.6	63,995	100.0
Total		15,604	1.2	174,651	13.7	257,080	20.2	228,377	17.9	212,344	16.7	174,642	13.7	124,331	9.8	67,282	5.3	19,937	1.6	1,274,246	100.0

**Keski-Suomi**

*Municipality*

77	Hankasalmi	913	2.0	9,531	20.7	10,077	21.8	5,430	11.8	7,829	17.0	7,517	16.3	3,363	7.3	918	2.0	555	1.2	46,133	100.0
172	Joutsa	511	1.3	8,652	21.3	10,888	26.8	5,351	13.2	6,409	15.8	6,079	14.9	1,852	4.6	545	1.3	396	1.0	40,684	100.0
179	Jyväskylä	82	1.2	1,671	23.7	1,802	23.5	876	12.4	1,033	14.6	941	13.3	416	5.9	149	2.1	91	1.3	7,060	100.0
180	Jyväskylän mlk	660	1.9	7,460	21.0	8,419	23.7	4,558	12.8	5,559	15.7	5,234	14.7	2,294	5.5	851	2.4	476	1.3	35,511	100.0
182	Jämsä	1,402	1.5	17,972	18.8	20,143	21.0	15,095	15.8	15,912	16.6	13,821	14.4	6,834	7.1	2,840	3.0	1,815	1.9	95,834	100.0
183	Jämsänkoski	569	1.7	7,882	23.2	7,856	23.1	4,775	14.0	4,916	14.4	4,611	13.5	2,120	6.2	832	2.4	477	1.4	34,037	100.0
216	Kannonkoski	662	1.7	7,622	19.5	10,709	27.4	5,841	15.0	5,165	13.2	4,248	10.9	2,882	7.4	1,285	3.3	643	1.6	39,056	100.0
226	Karstula	862	1.2	12,372	17.5	20,451	28.9	13,101	18.5	9,794	13.8	6,725	9.5	4,452	6.3	1,811	2.6	1,236	1.7	70,804	100.0

(continued)

**Table 4a** (continued)

	Open regene-ration site												141+ years		Forest land total					
	(ha)	(%)	1-20 years	(%)	21-40 years	(%)	41-60 years	(%)	61-80 years	(%)	81-100 years	(%)	101-120 years	(%)		121-140 years	(%)	(ha)	(%)	
249	1,854	1.7	22,463	20.9	26,363	24.5	16,484	15.3	15,225	14.2	12,782	11.9	7,642	7.1	3,013	2.8	1,620	1.5	107,448	100.0
256	637	1.7	8,129	21.5	10,090	26.7	6,869	18.2	4,909	13.0	3,440	9.1	2,057	5.4	1,098	2.9	615	1.6	37,842	100.0
265	723	1.8	7,972	19.3	11,126	27.0	6,818	16.5	5,537	13.4	3,946	9.6	2,922	7.1	1,389	3.4	833	2.0	41,265	100.0
275	982	2.3	9,849	22.6	9,892	22.7	5,010	11.5	6,823	15.6	6,272	14.4	3,252	7.4	1,005	2.3	572	1.3	43,657	100.0
277	868	1.7	11,668	22.5	12,412	23.9	6,400	12.3	8,006	15.4	7,673	14.8	3,017	5.8	1,163	2.2	671	1.3	51,878	100.0
291	719	1.3	11,289	19.8	12,438	21.9	7,330	12.9	9,430	16.6	8,855	15.6	4,117	7.2	1,591	2.8	1,134	2.0	56,902	100.0
312	393	1.2	5,249	16.4	8,890	27.8	6,361	19.9	4,373	13.7	3,044	9.5	2,105	6.6	1,013	3.2	588	1.8	32,016	100.0
410	1,178	2.4	10,417	21.1	11,546	23.4	6,033	12.2	7,443	15.1	7,395	15.0	3,475	7.0	1,208	2.4	615	1.2	49,309	100.0
415	660	2.1	5,534	17.5	6,741	21.3	4,802	15.2	5,505	17.4	5,215	16.5	2,020	6.4	707	2.2	444	1.4	31,627	100.0
435	277	1.5	3,976	22.1	4,836	26.9	2,372	13.2	2,692	15.0	2,447	13.6	854	4.7	324	1.8	211	1.2	17,989	100.0
495	1,258	2.0	12,121	19.1	16,379	25.8	10,846	17.1	9,448	14.9	6,965	11.0	3,952	6.2	1,503	2.4	1,096	1.7	63,567	100.0
500	192	1.7	2,830	24.4	2,843	24.5	1,351	11.6	1,686	14.5	1,593	13.7	712	6.1	261	2.2	146	1.3	11,614	100.0
592	777	2.0	8,968	22.9	8,851	22.6	5,688	14.5	5,632	14.4	5,317	13.6	2,424	6.2	938	2.4	527	1.3	39,121	100.0
601	1,061	1.2	16,528	18.7	24,530	27.8	14,383	16.3	12,528	14.2	9,514	10.8	5,614	6.4	2,844	3.2	1,386	1.6	88,388	100.0
633	612	2.0	5,853	19.6	7,784	26.0	5,128	17.1	4,226	14.1	3,092	10.3	1,909	6.4	792	2.6	539	1.8	29,935	100.0
729	1,337	1.8	15,708	21.3	18,281	24.8	10,112	13.7	10,431	14.2	9,207	12.5	5,385	7.3	2,065	2.8	1,102	1.5	73,629	100.0
850	624	2.1	6,219	20.5	7,335	24.2	3,888	12.8	4,748	15.6	4,447	14.6	1,967	6.5	738	2.4	399	1.3	30,365	100.0
892	688	2.3	5,986	20.3	6,564	22.2	4,456	15.1	4,317	14.6	4,296	14.5	2,057	7.0	805	2.7	372	1.3	29,541	100.0
931	1,812	1.7	25,177	23.6	26,272	24.6	13,713	12.8	13,630	12.8	12,919	12.1	8,297	7.8	3,273	3.1	1,708	1.6	106,801	100.0
992	1,426	2.0	14,750	20.2	18,315	25.1	9,655	13.2	10,134	13.9	10,066	13.8	5,798	7.9	1,932	2.6	939	1.3	73,017	100.0
Total	23,738	1.7	283,847	20.5	341,834	24.7	202,725	14.6	203,340	14.7	177,663	12.8	93,786	6.8	36,893	2.7	21,205	1.5	1,385,031	100.0
<b>Pohjois-Savo Municipality</b>																				
140	1,351	2.4	13,701	24.3	13,329	23.7	7,648	13.6	7,469	13.3	7,244	12.9	3,736	6.6	1,113	2.0	722	1.3	56,313	100.0
174	715	2.0	8,656	23.7	8,557	23.4	4,179	11.4	5,420	14.8	5,227	14.3	2,754	7.5	617	1.7	428	1.2	36,552	100.0
204	870	1.5	10,669	18.3	13,277	22.7	7,920	13.6	9,762	16.7	9,875	16.9	4,346	7.4	960	1.6	718	1.2	58,399	100.0
227	600	1.5	9,158	22.8	9,515	23.7	4,723	11.8	6,239	15.5	5,736	14.3	3,015	7.5	825	2.1	363	0.9	40,174	100.0
239	696	1.7	8,088	20.2	9,306	23.2	5,718	14.2	6,100	15.2	5,457	13.6	3,009	7.5	1,245	3.1	509	1.3	40,129	100.0
263	1,242	1.2	21,092	21.1	24,901	24.9	17,046	17.0	16,472	16.5	11,381	11.4	4,989	5.0	1,842	1.8	1,082	1.1	100,047	100.0
297	1,397	1.5	20,135	22.0	21,531	23.5	9,800	13.7	14,676	16.0	14,187	15.5	6,897	7.5	1,925	2.1	947	1.0	91,494	100.0
402	850	1.8	9,793	20.9	11,306	24.1	6,395	10.7	7,026	15.0	6,506	13.9	3,469	7.4	912	1.9	570	1.2	46,826	100.0
420	1,201	1.3	17,456	18.2	22,545	23.5	11,089	11.6	15,778	16.5	17,101	17.8	7,489	7.8	2,169	2.3	1,045	1.1	95,872	100.0
476	547	1.6	7,296	21.0	7,758	22.3	4,315	12.4	5,658	16.3	5,170	14.9	2,866	8.2	769	2.2	397	1.1	34,778	100.0



534	Nilsiä	1,105	2,0	12,572	22,4	13,645	24,3	7,011	12,5	8,439	15,0	7,511	13,4	4,311	7,7	988	1,8	557	1,0	56,139	100,0
595	Pielavesi	1,577	1,7	19,489	20,6	22,200	23,5	13,328	14,1	14,655	15,5	12,993	13,7	6,940	7,3	2,145	2,3	1,281	1,4	94,608	100,0
686	Rautalampi	949	2,1	10,948	24,3	10,699	23,8	5,413	12,0	6,349	14,1	6,026	13,4	3,052	6,8	963	2,1	568	1,3	44,966	100,0
687	Rautavaara	2,092	2,2	15,745	16,5	24,964	26,2	15,886	16,7	16,267	17,1	11,087	11,6	6,465	6,8	1,834	1,9	942	1,0	95,281	100,0
749	Sillinjärvi	588	2,1	7,559	27,0	6,181	22,1	3,033	10,8	3,925	14,0	3,857	13,8	2,008	7,2	504	1,8	327	1,2	27,982	100,0
762	Sonkajärvi	1,324	2,4	23,311	19,2	30,322	25,0	19,222	16,4	20,383	16,8	13,637	11,2	7,383	6,1	2,191	1,8	1,365	1,1	121,388	100,0
778	Suonenjoki	1,324	2,2	11,869	19,6	12,426	20,6	7,945	12,0	10,236	16,9	10,348	17,1	4,865	8,1	1,427	2,4	697	1,2	60,436	100,0
844	Tervo	488	1,7	7,208	24,8	6,973	24,0	3,491	12,0	4,145	14,3	3,656	12,6	2,085	7,2	619	2,1	373	1,3	29,038	100,0
857	Tuusniemi	736	1,6	11,850	25,9	10,619	23,2	4,913	10,7	6,495	14,2	6,792	14,9	2,857	6,2	900	2,0	554	1,2	45,716	100,0
915	Varkaus	826	2,6	6,955	21,9	7,800	24,6	4,031	12,7	4,465	14,1	4,320	13,6	2,292	7,2	791	2,5	288	0,9	31,767	100,0
916	Varpaisjärvi	852	2,2	8,337	21,6	8,831	22,9	5,313	13,8	5,785	15,0	5,344	13,8	2,893	7,5	790	2,0	449	1,2	38,593	100,0
921	Vesanto	629	1,8	8,351	23,9	8,408	24,1	4,130	11,8	4,891	14,0	4,531	13,0	2,555	7,3	930	2,7	474	1,4	34,898	100,0
925	Vieremä	1,312	1,8	15,721	21,3	19,291	26,1	12,297	16,7	10,893	14,8	7,939	10,8	4,029	5,5	1,399	1,9	910	1,2	73,791	100,0
Total		24,817	1,8	285,958	21,1	324,383	23,9	184,845	13,6	211,529	15,6	185,925	13,7	94,306	7,0	27,856	2,1	15,565	1,1	1,355,185	100,0

### Pohjois-Karjala

<i>Municipality</i>																					
45	Eno	1,482	1,8	20,342	24,8	18,883	23,0	12,306	15,0	7,515	9,2	12,013	14,7	5,866	7,2	2,272	2,8	1,294	1,6	81,974	100,0
146	Ilomantsi	641	0,3	37,026	16,7	50,268	22,6	48,935	22,0	35,198	15,9	27,705	12,5	11,027	5,0	5,262	2,4	6,023	2,7	222,086	100,0
167	Joensuu	1,290	1,3	22,881	22,8	25,778	25,6	13,243	13,2	11,909	11,9	15,521	15,4	6,638	6,6	2,292	2,3	973	1,0	100,525	100,0
176	Juuka	1,288	1,0	21,754	16,8	26,949	20,8	29,941	23,1	18,293	14,1	16,023	12,4	7,867	6,1	4,936	3,8	2,599	2,0	129,651	100,0
248	Kesälahti	444	1,4	7,109	21,6	9,409	28,6	4,220	12,8	4,156	12,7	4,541	13,8	2,191	6,7	580	1,8	707	0,6	32,857	100,0
260	Kitee	1,282	1,8	18,174	25,9	17,480	24,9	9,769	13,9	8,390	11,9	7,063	10,1	5,291	7,5	2,040	2,5	794	1,1	70,282	100,0
276	Kontiolahdi	702	1,1	14,922	22,4	16,501	24,7	9,391	14,1	8,647	13,0	9,504	14,3	4,257	6,4	1,663	2,5	1,104	1,7	66,689	100,0
309	Outokumpu	183	0,5	6,408	18,0	9,692	27,2	6,559	18,4	3,134	8,8	4,420	12,4	2,996	8,4	1,581	4,4	643	1,8	35,615	100,0
422	Lieksa	2,417	0,8	51,050	17,4	70,483	24,1	55,183	18,8	43,179	14,7	32,524	11,1	16,220	5,5	8,199	2,8	13,846	4,7	293,102	100,0
426	Liperi	701	1,3	13,507	24,0	15,978	28,4	9,495	16,9	6,029	10,7	5,468	9,7	3,414	6,1	1,302	2,3	289	0,5	56,182	100,0
541	Nurmes	1,649	1,2	25,651	18,6	32,813	23,8	28,573	20,7	17,620	12,8	12,493	9,1	8,862	6,4	4,718	3,4	5,700	4,1	138,077	100,0
607	Polvijärvi	653	1,0	12,165	19,1	15,440	24,3	14,211	22,3	7,646	12,0	7,464	11,7	3,953	6,2	1,814	2,9	311	0,5	63,658	100,0
632	Pyhäselkä	115	0,5	6,310	29,8	5,515	26,0	2,667	12,6	3,470	16,4	1,912	9,0	652	3,1	413	2,0	145	0,7	21,200	100,0
707	Rääkkylä	636	1,9	7,409	21,6	8,017	23,4	6,556	19,2	4,677	13,7	3,538	10,3	2,408	7,0	720	2,1	281	0,8	34,242	100,0
848	Tohmajärvi	948	1,4	15,293	22,5	17,886	26,3	11,487	16,9	7,701	11,3	8,163	12,0	4,252	6,3	1,343	2,0	900	1,3	67,974	100,0
911	Valtamo	560	0,8	15,705	23,1	15,386	22,6	14,648	21,5	8,466	12,4	5,770	8,5	4,042	5,9	1,845	2,7	1,642	2,4	68,064	100,0
Total		14,992	1,0	295,704	20,0	356,479	24,1	277,185	18,7	196,030	13,2	174,122	11,8	89,937	6,1	40,980	2,8	36,750	2,5	1,482,179	100,0

### Kainuu

<i>Municipality</i>																					
105	Hyrynsalmi	879	0,7	19,980	16,8	27,898	23,4	24,943	20,9	13,985	11,7	8,471	7,1	6,037	5,1	6,041	5,1	10,871	9,1	119,104	100,0
205	Kajaniemi	1,220	0,8	24,143	16,3	25,525	17,3	38,166	25,8	24,475	16,6	12,617	8,5	10,392	7,0	5,653	3,8	5,717	3,9	147,909	100,0
290	Kuhmo	1,794	0,4	65,561	16,1	93,563	23,0	84,703	20,8	50,257	12,4	30,461	7,5	18,669	4,6	24,504	6,0	37,118	9,1	406,629	100,0
578	Paltamo	968	1,2	14,368	18,0	15,929	19,9	17,617	22,1	11,696	14,6	7,081	8,9	4,889	6,1	3,972	5,0	3,353	4,2	79,873	100,0

(continued)

**Table 4a** (continued)

	Open regene- ration site		1–20 years		21–40 years		41–60 years		61–80 years		81–100 years		101–120 years		121–140 years		141+ years		Forest land total		
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
620 Puolanka	1,785	0.9	37,138	18.5	40,085	19.9	38,572	19.2	24,447	12.2	17,232	8.6	11,595	5.8	10,471	5.2	19,773	9.8	201,099	100.0	
697 Ristijärvi	581	0.8	13,326	18.3	18,637	25.6	15,209	20.9	6,961	9.6	3,987	5.5	3,809	5.2	3,534	4.9	6,693	9.2	72,737	100.0	
765 Sotkamo	2,110	0.9	40,496	17.7	53,897	23.5	52,995	23.2	28,881	12.6	15,507	6.8	11,747	5.1	12,323	5.4	10,973	4.8	228,929	100.0	
777 Suomussalmi	2,195	0.5	83,636	19.8	88,557	20.9	71,224	16.8	47,027	11.1	32,552	7.7	19,348	4.6	24,605	5.8	54,032	12.8	423,176	100.0	
785 Vaala	506	0.6	11,886	13.0	9,729	10.7	25,229	27.7	20,292	22.3	11,071	12.1	7,322	8.0	2,972	3.3	2,188	2.4	91,195	100.0	
Total	12,040	0.7	310,535	17.5	373,820	21.1	368,657	20.8	228,022	12.9	138,978	7.9	93,808	5.3	94,074	5.3	150,718	8.5	1,770,651	100.0	
<b>Pohjois-Pohjanmaa</b>																					
<i>Municipality</i>																					
9 Alavieska	342	2.1	2,347	14.7	2,273	14.2	2,774	17.3	3,879	24.2	2,544	15.9	1,007	6.3	695	4.3	146	0.9	16,007	100.0	
69 Haapajärvi	880	1.5	7,273	12.6	10,038	17.4	11,526	20.0	12,985	22.5	8,496	14.7	3,913	6.8	2,001	3.5	657	1.1	57,768	100.0	
71 Haapavesi	1,431	1.9	8,732	11.7	8,379	11.2	16,504	22.1	19,146	25.6	12,480	16.7	4,582	6.1	2,634	3.5	950	1.3	74,839	100.0	
72 Hailuoto	379	2.7	2,561	18.4	2,389	17.1	2,524	18.1	2,518	18.1	1,500	10.8	1,095	7.9	918	6.6	66	0.5	13,950	100.0	
84 Haukipudas	532	1.7	4,850	15.9	4,403	14.4	6,014	19.7	6,162	20.2	4,251	13.9	2,035	6.7	1,236	4.1	1,006	3.3	30,489	100.0	
139 Ii	1,138	1.1	14,244	13.2	15,351	14.2	23,595	21.9	23,502	21.8	14,515	13.5	8,589	8.0	3,941	3.7	2,935	2.7	107,809	100.0	
208 Kalajo	1,262	2.7	6,349	13.5	8,220	17.5	8,624	18.4	11,408	24.3	6,297	13.4	2,387	5.1	1,683	3.6	694	1.5	46,925	100.0	
244 Kempele	81	1.2	911	12.9	1,173	16.6	1,522	21.6	1,609	22.8	844	12.0	581	8.2	251	3.6	77	1.1	7,050	100.0	
247 Kestilä	219	0.5	4,489	10.8	4,511	10.8	10,163	24.4	9,899	23.8	6,735	16.2	3,038	7.3	1,876	4.5	719	1.7	41,649	100.0	
255 Kivimäki	251	1.1	2,798	12.0	3,668	15.7	4,689	20.1	5,038	21.6	3,717	16.0	1,702	7.3	671	2.9	764	3.3	23,298	100.0	
305 Kuusamo	4,370	1.2	68,765	19.4	69,479	19.6	43,766	12.3	50,719	14.3	26,724	7.5	14,829	4.2	17,973	5.1	58,622	16.5	355,247	100.0	
317 Kärsämäki	530	1.0	5,934	11.5	7,091	13.8	12,135	23.5	12,103	23.5	8,230	16.0	3,116	6.0	1,675	3.3	744	1.4	51,559	100.0	
425 Liminka	214	0.6	3,937	10.9	5,740	16.0	10,304	28.6	8,020	22.3	4,653	12.9	2,062	5.7	766	2.1	300	0.8	35,995	100.0	
436 Lumijoki	176	1.4	1,806	14.0	2,491	19.2	3,374	26.1	2,729	21.1	1,343	10.4	757	5.9	230	1.8	40	0.3	12,948	100.0	
483 Merijärvi	328	1.9	2,041	11.5	2,233	12.6	2,995	16.9	4,841	27.4	3,132	17.7	1,190	6.7	712	4.0	224	1.3	17,698	100.0	
494 Muhos	741	1.6	5,953	12.4	5,834	12.2	11,476	24.0	10,718	22.4	6,531	13.6	3,286	6.9	2,246	4.7	1,137	2.4	47,923	100.0	
535 Nivala	787	2.6	4,812	15.9	3,934	13.0	5,063	16.7	6,767	22.3	4,458	14.7	2,411	7.9	1,526	5.0	590	1.9	30,348	100.0	
563 Oulainen	1,391	3.1	6,202	13.9	4,602	10.3	8,407	18.8	10,494	23.5	7,174	16.0	3,313	7.4	1,932	4.3	1,234	2.8	44,748	100.0	
564 Oulu	229	1.2	2,214	11.2	2,861	14.5	3,789	19.1	4,269	21.6	3,186	16.1	1,842	9.3	782	4.0	613	3.1	19,791	100.0	
567 Oulunsalo	148	1.4	1,281	12.0	1,506	14.1	2,288	21.5	2,523	23.7	1,549	14.5	827	7.8	392	3.7	138	1.3	10,653	100.0	
603 Piippöla	338	1.0	3,632	10.4	4,111	11.7	8,447	24.1	9,059	25.8	5,477	15.6	2,325	6.6	1,184	3.4	498	1.4	35,071	100.0	
615 Pudasjärvi	3,428	0.9	47,960	13.0	62,858	17.0	79,025	21.4	77,280	21.0	39,543	10.7	16,249	4.4	13,303	3.6	29,277	7.9	368,924	100.0	
617 Puukkala	308	1.1	2,757	9.5	3,004	10.4	6,657	23.0	7,926	27.4	5,074	17.6	1,891	6.5	922	3.2	377	1.3	28,916	100.0	
625 Pyhäjoki	984	2.4	5,934	14.2	6,896	16.5	7,771	18.6	10,734	25.7	5,847	14.0	2,014	4.8	1,166	2.8	382	0.9	41,729	100.0	

626	Pyhäsalmi	1,331	1.3	14,602	14.0	19,322	18.5	23,675	22.7	21,018	20.2	13,400	12.9	5,869	5.6	4,275	4.1	735	0.7	104,227	100.0
630	Pyhäntä	192	0.3	6,004	10.1	6,343	10.6	13,749	23.1	14,735	24.7	10,008	16.8	4,869	8.2	2,520	4.2	1,232	2.1	59,652	100.0
678	Raahе	649	1.7	4,443	11.6	6,112	15.9	8,072	21.0	9,112	23.7	5,903	15.4	2,974	7.7	921	2.4	265	0.7	38,450	100.0
682	Rantsila	582	1.2	4,480	9.0	5,267	10.5	12,490	25.0	13,529	27.0	8,431	16.8	3,101	6.2	1,509	3.0	672	1.3	50,060	100.0
691	Reisjärvi	465	1.4	5,354	15.6	8,662	25.3	6,410	18.7	6,315	18.4	4,015	11.7	1,734	5.1	772	2.3	536	1.6	34,263	100.0
746	Sievi	880	1.7	7,856	14.8	9,845	18.5	9,354	17.6	12,159	22.9	6,824	12.8	2,846	5.4	1,849	3.5	1,546	2.9	53,158	100.0
748	Siikajoki	1,093	1.6	7,474	11.0	9,806	14.4	16,155	23.7	17,445	25.6	9,486	13.9	5,085	7.5	1,340	2.0	326	0.5	68,211	100.0
832	Taivalkoski	2,848	1.6	30,515	16.8	34,716	19.1	30,238	16.6	31,868	17.5	11,544	6.3	5,374	3.0	7,137	3.9	27,991	15.4	182,232	100.0
859	Tyrnävä	231	0.9	2,682	10.3	3,684	14.1	6,998	26.8	5,768	22.1	3,883	14.9	1,604	6.1	878	3.4	401	1.5	26,129	100.0
889	Utajärvi	887	0.8	10,958	10.3	11,205	10.5	24,914	23.3	25,150	23.5	16,779	15.7	8,711	8.1	5,375	5.0	2,976	2.8	106,956	100.0
926	Vihanti	595	1.8	3,591	10.8	4,223	12.7	7,119	21.4	9,064	27.3	5,325	16.0	2,084	6.3	876	2.6	356	1.1	33,232	100.0
972	Yli-Ii	436	0.9	5,801	11.4	7,024	13.8	12,852	25.2	11,597	22.7	7,092	13.9	3,438	6.7	1,430	2.8	1,402	2.7	51,073	100.0
973	Ylikiminki	925	1.4	6,548	9.8	6,510	9.7	15,316	22.9	16,956	25.3	12,234	18.3	4,700	7.0	1,944	2.9	1,839	2.8	66,971	100.0
977	Ylivieska	1,080	2.7	6,516	16.1	4,915	12.1	7,425	18.3	8,927	22.0	6,390	15.8	2,635	6.5	1,948	4.8	670	1.7	40,505	100.0
Total		32,680	1.3	334,605	13.7	380,680	15.6	488,201	20.0	517,973	21.3	305,612	12.5	140,068	5.8	93,497	3.8	143,134	5.9	2,436,451	100.0

### Lapland

<i>Municipality</i>																					
47	Enontekiö	603	0.6	7,086	7.5	4,085	4.3	7,858	8.3	14,243	15.1	18,784	19.9	4,721	5.0	2,229	2.4	34,726	36.8	94,334	100.0
148	Inari	328	0.1	25,916	3.6	36,114	5.1	77,797	10.9	129,636	18.2	88,032	12.4	25,321	3.6	11,329	1.6	317,643	44.6	712,116	100.0
240	Kemi	132	2.1	1,687	26.3	1,461	22.8	1,134	17.7	438	6.8	300	4.7	665	10.4	436	6.8	155	2.4	6,409	100.0
241	Keminmaa	391	0.9	8,429	18.7	8,480	18.8	8,714	19.3	6,920	15.3	3,405	7.6	3,684	8.2	3,317	7.4	1,782	4.0	45,121	100.0
261	Kitilä	5,346	1.1	57,797	12.4	51,665	11.1	42,464	9.1	81,070	17.4	72,799	15.6	45,979	9.9	20,763	4.5	89,112	19.1	466,995	100.0
273	Kolari	1,336	0.8	21,886	12.6	18,997	10.9	24,461	14.1	35,405	20.4	24,003	13.8	13,997	8.1	8,820	5.1	24,771	14.3	173,677	100.0
320	Kemijärvi	1,781	0.7	32,726	13.0	35,370	14.0	41,896	16.6	52,083	20.6	31,164	12.4	16,538	6.6	10,410	4.1	30,391	12.0	252,360	100.0
498	Muonio	486	0.4	15,258	12.6	12,440	10.3	11,048	9.1	12,791	10.6	16,074	13.3	11,530	5.6	6,802	5.6	34,736	28.7	121,167	100.0
583	Pelkosenniemi	939	0.8	17,883	14.8	21,675	17.9	16,828	13.9	22,426	18.5	15,001	12.4	7,019	5.8	3,681	3.0	15,553	12.9	121,006	100.0
614	Posio	2,543	1.2	29,212	14.1	27,159	13.1	31,156	15.0	39,732	19.1	24,036	11.6	11,765	5.7	8,921	4.3	33,050	15.9	207,573	100.0

(continued)

**Table 4a** (continued)

	Open regene- ration site		1–20 years		21–40 years		41–60 years		61–80 years		81–100 years		101–120 years		121–140 years		141+ years		Forest land total	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
683	2,019	1.0	34,980	17.4	32,746	16.3	35,048	17.4	40,944	20.4	22,292	11.1	8,178	4.1	5,936	3.0	18,994	9.4	201,135	100.0
698	4,643	0.8	78,364	14.0	68,771	12.3	81,993	14.7	133,467	23.8	73,964	13.2	36,004	6.4	20,836	3.7	61,751	11.0	559,792	100.0
732	2,064	0.5	55,552	14.6	59,341	15.5	40,093	10.5	60,816	15.9	41,965	11.0	19,036	5.0	10,112	2.7	92,939	24.3	381,918	100.0
742	2,761	0.6	60,151	13.7	42,821	9.7	47,426	10.8	69,352	15.8	51,944	11.8	24,490	5.6	16,515	3.8	124,491	28.3	439,951	100.0
751	629	0.7	11,729	13.1	12,447	13.9	18,905	21.0	17,456	19.4	9,943	11.1	7,562	8.4	4,301	4.8	6,878	7.7	89,850	100.0
758	6,096	0.9	73,444	11.0	71,551	10.7	53,265	8.0	98,822	14.8	101,808	15.2	48,205	7.2	22,114	3.3	192,841	28.9	668,146	100.0
845	621	0.6	15,603	14.3	12,699	11.6	22,566	20.6	18,916	17.3	13,315	12.2	8,531	7.8	9,882	9.0	7,272	6.7	109,404	100.0
851	753	0.9	15,613	18.9	13,808	16.7	17,625	21.3	10,987	13.3	8,355	10.1	5,547	6.7	6,520	7.9	3,446	4.2	82,653	100.0
854	1,157	0.9	21,170	15.7	18,082	13.4	22,384	16.6	25,900	19.2	15,641	11.6	9,272	6.9	6,090	4.5	14,948	11.1	134,644	100.0
890	–	–	161	2.6	15	0.2	2,251	35.7	2,804	44.5	112	1.8	108	1.7	183	2.9	664	10.5	6,297	100.0
976	1,095	0.8	19,278	13.6	16,409	11.6	27,399	19.4	28,588	20.2	17,979	12.7	9,823	7.0	5,805	4.1	14,947	10.6	141,322	100.0
Total	35,723	0.7	603,925	12.0	566,136	11.3	632,309	12.6	902,795	18.0	650,915	13.0	317,975	6.3	185,003	3.7	1,121,089	22.4	5,015,871	100.0

**Table 4b** The mean volume of growing stock in age classes on forest land (By forestry centres).

	Open regeneration site	1–20 years	21–40 years	41–60 years	61–80 years	81–100 years	101–120 years	121–140 years	141+ years	Forest land total
	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)
<b>Åland</b>										
<i>Municipality</i>										
35	26.3	9.8	100.0	140.9	85.8	107.4	196.4	170.8	93.0	92.1
43	0.0	24.2	101.1	194.3	199.3	220.9	164.4	208.7	187.4	146.2
60	0.0	18.8	110.5	191.2	199.2	227.9	169.3	210.7	214.3	141.9
62	0.0	25.6	110.0	179.7	167.4	182.8	146.0	174.3	127.4	136.0
65	0.0	20.4	92.9	183.4	176.7	219.9	160.6	190.6	193.5	139.4
76	0.0	22.0	109.2	191.7	201.9	219.5	161.2	191.9	197.1	144.5
170	0.0	20.7	112.3	195.0	211.4	226.8	174.0	224.4	221.0	147.7
295	33.2	26.1	111.2	161.1	115.7	140.4	149.8	137.4	103.9	115.6
318	–	28.9	90.1	118.7	121.7	105.7	122.9	115.7	85.4	93.0
417	0.0	22.2	112.5	192.3	199.3	228.6	167.5	204.4	219.5	143.9
438	0.0	20.9	100.3	183.0	187.6	223.0	163.0	201.1	165.3	145.1
478	0.0	18.2	96.3	168.3	181.6	207.0	148.8	162.4	184.8	115.1
736	0.4	21.7	101.7	184.6	193.6	225.0	164.2	197.1	182.4	151.2
766	26.6	15.5	93.7	138.7	118.3	153.1	147.9	147.1	123.2	102.9
771	0.1	21.2	106.9	187.1	195.4	221.7	163.5	192.5	173.0	144.2
941	5.9	21.0	93.7	170.5	163.7	211.1	157.3	197.3	158.8	137.4
Total	5.3	21.6	106.2	181.1	169.6	211.1	161.1	196.7	170.0	138.5
<b>Rannikko/Etelärannikko</b>										
<i>Municipality</i>										
40	0.0	22.1	93.3	177.5	185.3	163.8	181.9	151.7	121.1	142.8
49	0.0	50.9	97.9	174.6	226.4	232.9	194.9	162.6	172.0	165.0

(continued)

Table 4b (continued)

	Open regene- ration site	1–20 years	21–40 years	41–60 years	61–80 years	81–100 years	101–120 years	121–140 years	141+ years	Forest land total
	(m <sup>2</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)
78	Hanko-Hangö	0.0	111.4	143.2	164.8	191.5	129.1	150.6	213.3	138.3
91	Helsinki-Helsingfors	0.8	51.8	176.8	207.8	231.0	149.9	173.3	98.5	137.2
92	Vantaa-Vanda	0.0	45.3	110.8	242.6	226.4	214.6	205.5	143.0	157.4
101	Houtskär-Houtskari	–	42.7	106.3	131.6	157.2	153.9	65.1	205.3	126.5
149	Ingå-Inkoo	0.0	39.2	94.0	188.3	270.1	175.7	174.3	166.2	169.8
150	Iniö	–	45.3	97.9	122.6	199.2	155.8	116.8	194.1	140.9
220	Karis-Karjaa	0.0	29.5	111.0	188.0	246.9	173.8	161.1	169.0	151.7
235	Kauniainen-Grankulla	–	51.0	159.3	215.6	222.5	174.5	151.7	172.5	157.2
243	Kimito-Kemiö	0.0	22.8	110.9	143.9	183.2	168.3	158.4	122.0	139.7
257	Kirkkonummi-Kyrkslätt	1.3	41.9	86.0	181.3	242.1	161.4	172.4	163.7	161.1
279	Korpo-Korppoo	0.0	38.0	101.5	127.3	142.4	168.4	92.2	207.5	120.7
407	Lapinjärvi-Lappträsk	2.6	41.6	94.4	169.5	185.1	235.6	198.7	197.0	154.8
424	Liljendal	1.7	37.7	93.4	166.6	176.2	229.7	173.5	188.8	150.4
434	Loviisa-Lovisa	9.6	22.7	103.9	170.4	177.4	213.2	61.3	222.2	156.4
533	Nagu-Nauvo	0.0	36.7	98.3	141.1	144.5	181.2	143.9	201.0	131.0
573	Pargas-Parainen	0.0	27.6	94.3	142.2	159.7	161.8	130.9	135.4	126.6
585	Pernå-Pernaja	3.6	33.8	100.3	169.7	187.1	223.9	127.9	193.1	146.9
606	Pohja-Pojo	0.0	24.6	104.9	154.8	174.2	188.1	209.2	183.5	133.8
638	Porvoo-Borgå	3.4	44.4	107.1	181.7	213.4	199.7	193.5	128.0	155.6
701	Ruotsinpyhtää-Strömfors	4.2	25.7	99.9	168.7	168.5	221.5	61.2	190.0	145.6
753	Sipoo-Sjöbo	3.9	47.2	117.8	189.2	228.8	242.9	248.4	68.9	166.5
755	Siuntio-Sjundeå	1.2	45.8	94.6	213.1	273.0	188.5	165.7	172.4	174.5
835	Ekenäs-Tammisaari	0.0	27.3	108.4	141.8	179.5	153.1	151.3	184.4	137.4
923	Västanfjärd	0.0	20.5	108.3	156.1	182.3	155.5	161.7	160.3	138.7
Total		1.8	36.6	103.0	168.4	199.2	180.1	163.5	174.6	148.2

<b>Rannikko/Pohjanmaa</b>												
<i>Municipality</i>												
231	Kaskinen-Kaskö	0.0	27.3	92.8	92.0	159.5	176.7	193.0	65.0	302.4	108.7	
272	Kokkola-Karleby	3.3	18.2	72.9	106.8	147.9	173.6	172.1	170.6	151.4	103.1	
280	Korsnäs	0.7	19.0	82.7	117.2	149.1	163.6	178.9	126.2	158.1	104.1	
287	Kristinestad-Kristiinankaupunki	0.7	26.8	75.5	116.2	152.0	171.5	175.2	110.1	98.5	117.2	
288	Kronoby-Kruunupy	2.1	13.5	69.4	87.1	135.7	160.4	166.8	172.7	115.1	102.1	
440	Larsmo-Luoto	3.1	16.5	68.3	107.1	148.8	162.3	172.0	165.6	149.7	92.6	
475	Malax-Maalathi	0.4	21.0	72.5	97.1	142.5	177.6	177.1	135.3	166.9	97.2	
499	Korsholm-Mustasaari	0.0	21.4	65.2	75.6	168.4	182.0	174.0	191.9	174.5	106.4	
545	Närpes-Närpiö	0.3	25.0	75.3	106.0	142.1	170.5	181.0	138.6	159.2	113.5	
559	Oravais-Oravainen	1.1	19.5	73.2	105.0	137.5	160.3	176.9	122.6	113.9	98.2	
598	Jakobstad-Pietarsaari	0.8	19.3	73.7	115.4	136.5	141.1	178.4	136.1	125.1	95.0	
599	Pedersöre-Pedersören kunta	2.1	15.5	69.9	97.4	122.8	153.6	163.6	179.5	109.8	97.2	
893	Nykarleby-Utsikaarlepyy	1.0	18.3	68.5	98.8	113.8	137.3	164.0	130.8	118.2	90.4	
905	Vaasa-Vasa	0.1	22.9	74.6	90.8	187.1	176.2	191.1	160.1	226.0	118.7	
945	Vörå-Maxmo-Vöyri-Maksamaa	0.4	20.0	79.1	90.9	159.1	184.5	177.9	141.3	115.4	110.7	
Total		1.1	20.2	72.1	98.6	142.6	168.1	173.3	151.0	136.7	104.3	
<b>Lounais-Suomi</b>												
<i>Municipality</i>												
6	Alastaro	17.5	33.1	112.8	157.6	202.1	196.2	193.0	194.8	140.6	148.0	
17	Askainen	0.0	25.0	107.9	167.9	192.8	173.5	174.4	163.3	137.2	144.4	
19	Aura	9.8	38.6	95.8	161.9	206.6	196.4	209.1	234.1	158.2	150.2	
50	Eura	11.6	34.3	108.3	151.5	203.0	192.4	199.8	191.2	159.2	143.6	
51	Eurajoki	6.3	35.1	111.6	161.7	228.5	198.5	207.8	203.0	158.5	148.0	
73	Halikko	0.0	30.8	113.2	174.3	195.6	195.7	201.4	220.3	117.8	152.6	
79	Harjavalta	15.7	31.5	122.1	153.5	199.5	180.0	147.0	168.4	160.5	138.4	
99	Honkajoki	6.6	18.9	54.8	90.2	115.8	141.9	123.3	121.7	150.1	92.9	

(continued)

Table 4b (continued)

	Open rege- neration site (m <sup>3</sup> /ha)	1–20 years (m <sup>3</sup> /ha)	21–40 years (m <sup>3</sup> /ha)	41–60 years (m <sup>3</sup> /ha)	61–80 years (m <sup>3</sup> /ha)	81–100 years (m <sup>3</sup> /ha)	101–120 years (m <sup>3</sup> /ha)	121–140 years (m <sup>3</sup> /ha)	141+ years (m <sup>3</sup> /ha)	Forest land total (m <sup>3</sup> /ha)	
102	Huitinen	17.5	33.9	117.1	163.7	216.0	212.1	213.1	205.7	138.7	153.3
181	Jämijärvi	13.2	22.6	88.1	136.9	162.9	184.5	175.6	129.5	159.3	121.7
202	Kaarina	0.0	26.1	107.9	164.8	185.7	169.3	171.8	171.4	110.1	133.7
214	Kankaanpää	9.5	24.9	73.8	111.6	146.0	166.2	160.0	134.0	139.1	112.1
230	Karvia	4.7	16.9	56.6	86.0	116.9	138.6	122.3	120.2	131.2	93.2
252	Kiikala	8.0	33.9	100.6	169.0	200.4	197.9	209.7	226.6	149.2	155.5
254	Kiikoinen	12.0	24.3	98.7	142.9	189.3	227.9	213.3	144.1	109.7	136.9
259	Kisko	7.2	32.9	100.6	170.1	205.8	198.8	199.2	229.6	145.2	153.5
262	Kiukainen	8.2	33.0	113.4	165.2	220.0	209.1	220.9	192.8	146.5	147.1
271	Kokemäki	11.7	30.7	116.7	147.4	201.8	197.8	182.4	179.2	145.2	140.6
284	Koski Tl	20.1	34.0	114.2	163.7	211.8	221.6	235.2	214.8	108.6	165.2
304	Kustavi	0.0	30.8	89.0	155.6	183.7	149.4	169.1	168.3	200.9	142.9
308	Kuusjoki	16.7	39.5	107.9	165.5	205.5	209.7	232.7	219.4	174.0	164.7
319	Köyliö	8.8	32.4	104.7	145.5	190.6	180.4	189.0	186.8	137.6	140.6
400	Laitila	7.4	36.9	105.0	145.1	214.2	179.9	190.8	201.7	148.5	144.5
406	Lappi	10.0	34.5	105.0	146.3	206.7	185.0	184.5	185.4	149.5	141.3
413	Lavia	13.9	25.1	93.4	143.3	185.7	205.1	190.2	146.4	137.0	131.9
419	Lemu	0.1	23.7	94.4	153.4	187.0	170.5	162.4	158.0	131.9	126.2
423	Lieto	5.2	36.5	99.3	156.6	199.1	187.7	202.7	231.7	137.1	150.8
430	Loimaa	18.2	33.3	110.3	163.6	211.7	223.3	233.4	222.9	128.8	165.5
442	Luvia	10.4	31.7	112.1	190.0	243.6	274.5	229.5	200.8	209.1	168.5
480	Marttila	19.8	39.2	105.3	158.0	199.0	194.9	212.6	213.4	164.6	151.6
481	Masku	0.1	30.8	88.9	153.9	182.7	168.2	182.0	178.3	152.3	134.4
482	Mellilä	20.6	33.7	110.1	159.9	207.7	198.8	214.4	201.7	159.4	152.2
484	Merikarvia	13.5	29.2	91.0	138.6	183.1	194.3	191.3	147.1	176.9	125.1
485	Merimasku	0.0	33.7	104.7	163.6	189.1	165.1	171.1	150.7	193.9	150.7



501	Muurla	4.1	35.0	103.8	171.4	205.2	193.9	197.4	242.6	130.6	154.9
503	Mynämäki	10.1	33.8	97.0	145.6	193.7	175.4	181.3	184.2	147.9	135.2
529	Naantali	0.0	27.2	103.9	163.0	183.6	168.8	178.2	158.1	121.4	142.1
531	Nakkila	7.7	29.1	119.9	170.4	228.8	213.8	207.6	198.1	217.3	150.2
537	Noormarkku	12.1	27.5	99.9	150.8	200.1	226.2	202.3	183.9	189.3	142.6
538	Nousiainen	18.0	32.7	102.9	153.2	209.1	184.0	196.3	208.1	149.8	151.0
561	Oripää	9.6	34.3	94.7	142.0	185.3	182.4	185.9	195.0	159.1	140.2
577	Paimio	0.0	26.3	113.0	165.6	190.3	182.1	186.4	214.0	109.4	146.4
586	Perniö	3.2	34.1	103.9	170.3	206.0	194.5	188.4	252.6	130.1	157.9
587	Pertteli	9.2	35.6	102.4	169.0	207.2	194.8	210.7	223.6	134.9	154.5
602	Piikkiö	0.0	26.1	109.4	172.0	190.9	177.5	179.5	197.9	104.1	143.1
608	Pomarkku	14.2	27.1	97.0	147.3	201.3	221.9	221.1	185.4	185.0	154.5
609	Pori	8.7	28.3	106.9	170.2	228.7	237.1	231.4	197.3	211.2	144.0
631	Pyhärinta	7.5	41.7	103.0	152.2	231.0	187.7	171.2	222.1	127.8	152.2
636	Pöytyä	12.5	38.7	99.0	154.2	197.7	200.0	199.5	219.0	159.9	149.4
680	Raisio	0.0	26.5	97.3	161.3	191.3	169.2	168.7	173.1	113.3	133.4
684	Rauma	12.9	40.4	105.7	154.5	218.1	182.7	168.5	201.5	142.0	144.7
704	Rusko	0.2	32.9	87.8	151.2	185.9	173.1	180.2	181.9	176.3	136.4
705	Rymättylä	0.0	32.5	88.7	159.7	177.2	151.7	169.5	156.2	146.8	141.5
734	Salo	3.2	34.6	104.8	168.0	202.7	188.2	194.0	233.9	126.3	147.8
738	Sauvo	0.0	29.0	104.2	159.7	192.4	173.1	164.4	173.6	127.9	135.0
747	Siikainen	15.4	28.1	81.8	127.2	167.8	189.1	183.2	159.1	167.4	121.7
761	Somero	14.9	33.9	113.1	177.9	210.7	216.2	234.1	227.5	151.2	161.8
776	Suomusjärvi	3.7	28.1	103.5	179.0	201.4	202.4	206.6	219.9	155.3	150.3
783	Säkylä	13.7	33.0	102.6	144.3	192.5	171.5	183.2	191.0	135.2	141.3
784	Särkisalo-Finby	0.0	36.9	108.6	176.7	206.8	201.7	183.1	225.6	124.7	155.3
833	Taivassalo	0.0	26.5	102.0	157.2	175.0	160.6	164.7	162.7	152.4	140.8
838	Tarvasjoki	12.1	40.8	100.7	161.8	207.8	198.6	219.9	228.3	145.1	152.9

(continued)

Table 4b (continued)

	Open rege- ration site (m <sup>3</sup> /ha)	1–20 years (m <sup>3</sup> /ha)	21–40 years (m <sup>3</sup> /ha)	41–60 years (m <sup>3</sup> /ha)	61–80 years (m <sup>3</sup> /ha)	81–100 years (m <sup>3</sup> /ha)	101–120 years (m <sup>3</sup> /ha)	121–140 years (m <sup>3</sup> /ha)	141+ years (m <sup>3</sup> /ha)	Forest land total (m <sup>3</sup> /ha)
853	0.0	28.5	94.9	157.3	190.8	165.3	175.6	168.0	135.5	131.5
886	12.3	27.3	101.8	150.4	197.8	210.1	187.0	168.2	176.2	138.1
895	2.3	29.5	100.6	152.2	179.7	171.8	166.1	159.4	140.4	128.4
906	14.2	33.2	102.1	155.4	203.2	184.4	197.1	206.2	140.6	148.9
913	16.2	32.1	120.5	169.2	213.8	217.5	208.1	205.8	111.3	158.3
918	0.0	27.9	102.8	152.8	172.9	172.2	173.4	151.4	118.8	127.5
920	0.0	33.8	74.4	151.2	168.2	133.4	167.7	136.2	184.4	137.1
979	15.7	34.5	99.7	146.0	190.7	179.8	176.4	196.6	130.6	140.8
Total	10.8	30.9	99.4	148.8	191.4	189.8	189.4	184.4	152.4	139.8
<b>Häme-Uusimaa</b>										
<i>Municipality</i>										
15	19.2	40.6	91.5	166.3	204.2	204.9	234.3	184.2	171.0	146.9
16	4.4	28.0	111.0	175.2	221.5	222.3	225.2	223.5	234.0	157.6
18	7.6	41.5	101.5	177.4	188.6	241.3	220.7	214.0	183.1	166.1
61	8.0	36.4	91.6	160.0	188.2	233.9	250.6	253.2	83.3	155.8
81	0.0	35.8	130.4	171.4	225.9	243.5	213.5	191.7	171.7	155.9
82	13.7	28.5	107.8	171.2	205.3	211.6	223.2	271.5	162.6	145.6
83	10.2	26.8	105.0	194.5	231.0	234.0	254.4	266.5	164.2	176.8
86	10.0	29.5	91.9	178.8	224.1	231.3	232.7	186.8	151.5	158.6
98	10.6	29.8	92.7	179.1	222.2	235.5	235.3	201.9	206.8	149.5
103	7.1	46.4	85.7	152.7	225.6	204.3	274.9	213.3	100.9	167.3
106	7.6	27.6	102.6	169.3	210.9	218.3	232.0	196.9	142.0	156.5
109	4.1	26.7	109.3	182.5	222.4	245.9	242.6	262.9	124.5	153.2
111	23.8	32.0	106.2	174.0	194.2	217.5	220.8	162.2	227.0	143.7
165	0.9	26.7	103.9	173.0	221.2	245.8	236.3	277.3	141.3	162.0
169	14.4	41.3	99.7	170.1	204.1	234.8	258.1	269.9	95.9	167.1

186	Järvenpää	6.3	36.1	107.6	188.1	233.6	240.3	244.0	130.6	90.0	139.8
210	Kalvola	9.3	35.1	107.5	168.7	206.1	214.1	234.9	261.5	222.3	147.3
223	Karjalohja	2.1	23.8	99.1	190.4	212.8	216.3	210.5	194.4	131.1	137.3
224	Karkkila	2.9	20.7	107.9	177.5	233.9	233.5	225.9	216.9	115.4	162.6
245	Kerava	10.3	38.6	131.0	197.4	205.7	236.5	261.6	304.3	63.5	151.2
283	Hämeenkoski	3.4	30.9	93.6	186.0	228.3	246.0	235.6	201.5	203.7	154.7
316	Kärkölä	9.3	33.4	82.7	191.4	234.0	236.2	240.8	139.9	156.9	159.2
398	Lahti	22.1	30.0	104.6	164.4	224.2	196.4	226.8	202.2	148.0	134.6
401	Lammi	0.7	29.1	97.3	173.0	210.8	227.6	232.3	235.4	194.0	152.0
433	Loppi	3.3	22.3	103.9	163.6	216.1	227.9	218.5	249.0	136.0	158.6
444	Lohja-Lojo	0.4	32.2	96.0	212.0	264.9	227.5	189.6	159.5	127.0	154.7
504	Myrskylä-Mörskom	5.9	42.7	93.8	168.4	191.5	224.4	233.8	213.7	183.4	156.8
505	Mäntsälä	11.4	35.5	82.9	181.9	241.4	230.0	251.0	128.0	143.1	171.4
532	Nastola	18.8	27.1	102.4	165.7	203.2	199.0	217.9	193.1	164.4	136.4
540	Nummi-Pusula	3.4	21.5	105.8	191.7	237.1	211.0	224.7	174.8	113.4	146.4
543	Nurmijärvi	5.2	33.3	115.5	187.6	224.3	216.1	245.9	239.5	123.7	157.7
560	Orimattila	13.7	32.6	88.7	168.3	206.3	208.3	225.1	182.1	155.8	139.8
576	Padasjoki	0.0	27.9	111.8	155.3	224.6	231.5	223.4	220.3	234.1	163.5
611	Pomainen	6.6	37.6	98.0	187.1	193.6	241.8	225.0	210.4	127.3	155.9
616	Pukkila	6.0	38.1	91.9	178.8	208.5	226.4	240.4	194.8	155.5	149.0
692	Renko	0.0	20.7	102.6	166.2	225.3	222.5	231.7	260.7	153.4	160.5
694	Riihimäki	0.4	25.3	107.4	177.7	222.8	244.1	224.1	263.1	162.1	160.6
737	Sammatti	1.9	22.5	100.7	191.8	233.9	204.1	223.4	183.5	136.0	135.3
781	Sysmä	0.0	36.0	126.8	183.3	222.8	231.0	221.7	212.5	222.9	161.6
834	Tammela	4.7	28.7	93.0	166.4	193.9	215.4	224.3	238.3	128.1	150.9
855	Tuulos	1.1	21.6	92.1	175.6	215.7	215.8	235.6	235.6	174.3	151.7
858	Tuusula	8.6	34.5	117.5	194.5	233.7	229.2	266.0	245.8	123.7	160.7
927	Vihä	0.0	31.5	111.5	195.5	244.9	214.1	214.7	202.3	139.7	164.7
981	Ypäjä	20.5	42.0	97.9	166.4	204.7	217.5	274.7	275.7	104.7	172.1
Total		6.5	30.5	104.4	176.7	217.8	224.9	229.5	211.6	178.6	155.4

(continued)

Table 4b (continued)

	Open regene- ration site	1–20 years	21–40 years	41–60 years	61–80 years	81–100 years	101–120 years	121–140 years	141+ years	Forest land total
	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)
<b>Kaakkois-Suomi</b>										
<i>Municipality</i>										
44	4.2	26.5	96.4	161.2	205.6	246.5	235.7	186.4	181.2	149.0
75	3.9	26.4	94.0	154.2	186.0	235.6	216.0	195.7	180.4	136.2
142	6.8	32.7	95.3	163.4	199.6	232.8	216.2	165.1	175.0	138.1
153	13.3	18.1	128.1	186.6	228.8	217.3	236.2	228.1	192.9	149.8
163	7.5	31.4	111.5	162.5	207.1	239.3	241.4	192.5	197.6	150.5
173	12.3	19.5	127.1	184.0	227.0	212.5	251.7	245.1	215.8	154.9
285	2.5	27.5	103.9	162.3	207.7	199.7	215.5	182.1	191.4	135.2
286	6.7	26.3	96.8	161.3	189.7	229.7	207.8	166.8	168.0	119.2
306	6.9	32.4	97.8	164.6	193.1	249.8	221.1	174.7	189.3	135.5
405	6.0	19.0	106.0	169.4	214.6	234.4	238.1	224.1	242.4	146.8
416	8.7	23.3	112.5	181.0	221.1	237.0	255.6	241.9	236.2	155.8
441	3.6	24.2	98.2	146.2	187.1	245.1	222.5	202.1	178.8	142.2
489	7.0	20.6	92.2	151.7	192.7	216.3	217.2	243.4	178.2	131.1
580	11.5	24.3	114.9	160.9	191.1	220.6	219.8	237.6	180.4	123.1
624	1.9	30.8	108.4	162.2	201.7	211.8	206.5	172.1	175.4	142.3
689	20.2	23.3	118.6	171.1	211.3	223.6	233.6	258.5	181.1	144.4
700	14.9	22.4	112.8	147.9	208.5	218.0	223.5	254.0	199.5	142.2
739	9.6	25.4	110.1	154.9	196.1	227.2	237.3	220.8	148.6	150.6
754	2.8	27.5	97.0	147.9	183.7	224.9	219.7	186.6	179.5	135.7
775	19.7	18.1	110.4	135.5	200.9	201.7	216.2	168.2	140.4	138.0
831	11.2	24.2	117.7	163.6	208.3	210.5	232.1	186.8	189.6	149.5
909	5.2	29.1	102.3	152.6	188.1	238.6	231.5	203.2	184.9	141.3
935	4.8	20.5	88.8	156.0	186.7	205.1	211.6	248.6	157.2	121.6
978	5.5	20.4	91.0	156.5	196.3	218.9	231.8	229.0	133.2	132.9
Total	8.3	24.8	105.0	157.4	199.6	226.2	226.6	208.0	185.1	140.6

<b>Pirkanmaa</b>																
<i>Municipality</i>																
20	Akaa	16.5	24.7	98.1	162.8	205.5	216.5	216.4	177.1	171.1	131.8					
108	Hämeenkyrö	12.2	26.7	96.6	163.3	205.7	208.9	226.7	186.7	148.4	142.1					
143	Ikala	9.1	23.9	86.8	134.7	176.4	193.3	188.8	177.1	154.5	126.9					
177	Juupajoki	8.1	24.2	90.6	150.3	206.4	215.2	224.8	202.1	191.6	144.0					
211	Kangasala	11.1	28.2	96.9	163.8	211.1	215.4	229.5	196.6	177.9	142.3					
250	Kihniö	6.3	22.6	77.4	105.4	130.0	151.2	152.8	133.9	139.8	108.8					
289	Kuhmalampi	9.5	29.9	101.7	166.9	215.3	220.7	230.2	195.8	174.4	153.3					
303	Kuru	7.7	26.2	88.8	133.7	171.3	188.3	195.4	182.0	167.5	132.7					
310	Kylmäkoski	12.1	26.5	99.4	157.3	210.9	220.6	213.1	187.4	171.6	146.6					
418	Lempäälä	12.5	27.3	97.8	171.0	225.2	230.8	240.0	211.9	172.6	151.7					
493	Mouhijärvi	12.7	27.2	94.9	156.2	199.0	201.3	222.4	184.6	144.2	134.3					
506	Mänttä	8.4	27.5	95.4	158.9	223.0	237.4	235.9	233.6	218.3	153.3					
536	Nokia	12.6	28.5	92.7	164.5	216.9	213.9	214.7	192.2	166.9	139.6					
562	Orivesi	8.9	25.7	95.6	155.1	209.2	214.6	226.9	199.1	177.3	143.1					
581	Parkano	5.3	20.6	73.8	105.1	135.8	152.9	159.9	140.3	149.8	107.4					
604	Pirkkala	16.6	24.9	100.2	173.5	226.6	228.1	244.5	195.4	175.7	144.9					
619	Punkalaidun	21.0	35.3	113.1	162.5	213.8	215.4	230.7	215.2	117.0	164.9					
635	Pälkäne	11.0	31.1	106.3	177.1	224.9	240.5	238.1	200.2	192.6	165.2					
702	Ruovesi	8.2	25.0	90.9	150.6	206.0	215.8	220.6	204.8	190.5	149.6					
837	Tampere	10.9	25.4	98.9	162.2	216.0	217.0	235.8	204.5	186.0	149.7					
887	Urjala	10.8	26.4	97.0	156.7	213.9	222.7	227.2	196.1	147.3	149.9					
908	Valkeakoski	15.5	27.8	101.4	170.0	216.3	233.3	234.6	200.4	208.8	148.1					
912	Vammala	11.5	26.6	95.5	146.6	196.6	206.5	217.1	189.9	147.6	135.3					
922	Vesilampi	10.8	24.8	96.0	158.8	221.0	226.5	240.7	211.6	166.7	155.3					
933	Vilppula	7.6	25.3	91.8	153.7	213.4	223.8	222.6	191.4	199.1	150.1					
936	Virrat	7.2	20.9	81.7	119.6	157.1	174.0	176.2	160.3	159.7	117.0					
980	Ylöjärvi	10.2	26.4	95.2	159.5	210.9	212.2	228.7	202.3	166.2	142.7					
988	Äetsä	10.4	24.9	99.9	142.2	186.6	201.1	206.4	181.3	124.4	127.0					
Total		9.8	25.6	92.0	146.3	193.5	203.7	208.7	185.6	165.9	137.7					

(continued)

Table 4b (continued)

	Open regene- ration site	1–20 years	21–40 years	41–60 years	61–80 years	81–100 years	101–120 years	121–140 years	141+ years	Forest land total
	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)
<b>Etelä-Savo</b>										
<i>Municipality</i>										
46	10.0	24.3	106.5	155.9	217.9	234.7	207.4	244.2	255.3	136.6
90	12.1	17.7	107.5	146.4	222.6	223.2	193.5	236.8	213.3	125.8
97	8.0	28.4	111.3	165.0	208.7	231.5	211.8	220.7	187.8	141.3
171	4.8	21.9	92.4	134.1	215.6	238.0	232.2	252.7	174.5	135.7
178	4.2	21.3	99.5	145.9	210.0	233.0	214.1	228.9	191.7	139.2
213	4.6	22.5	91.9	141.4	191.4	231.4	231.7	222.1	180.7	134.9
246	25.8	26.7	114.9	155.3	202.2	216.7	204.3	240.0	171.5	132.3
491	3.7	21.1	96.9	157.9	198.0	229.2	232.8	222.1	202.4	137.6
507	4.7	22.2	111.1	157.6	197.5	223.2	200.7	238.4	176.0	128.5
588	4.9	23.3	99.7	167.0	217.4	225.5	212.7	225.4	110.0	132.4
593	4.7	22.6	90.1	129.4	202.9	224.8	217.1	211.2	180.5	128.4
618	18.2	25.4	113.6	174.1	205.2	227.7	244.4	260.4	233.2	144.2
623	28.2	22.2	110.4	152.0	187.5	196.4	160.2	189.3	243.4	133.7
681	8.1	26.2	103.7	161.8	222.7	232.8	217.6	201.3	224.7	130.2
696	4.8	24.0	108.2	157.7	209.8	228.8	198.3	197.4	192.0	138.3
740	23.7	27.6	119.6	161.0	194.2	214.7	203.6	227.6	228.0	134.5
741	7.4	20.8	98.4	142.6	220.7	236.3	168.8	249.3	234.9	130.4
768	19.1	21.6	112.9	157.9	191.6	240.1	203.9	230.3	252.8	132.4
Total	9.5	22.8	103.9	151.3	203.8	225.9	212.1	225.2	206.9	133.8
<b>Etelä-Pohjanmaa</b>										
<i>Municipality</i>										
4	1.7	10.0	52.5	87.9	129.1	137.9	148.4	141.3	84.6	84.5
5	3.0	9.3	57.7	88.2	130.1	136.4	134.8	133.1	124.0	92.9

10	Alavus	2.4	10.1	60.0	94.1	132.1	146.2	142.0	144.7	122.3	98.5
52	Evijärvi	1.9	10.0	58.5	84.5	125.5	151.0	169.5	164.4	109.4	93.0
74	Halsua	0.8	13.9	53.4	69.5	109.2	119.1	123.0	109.9	105.2	73.2
95	Himanka	2.1	13.6	60.4	96.4	118.1	166.7	164.4	141.8	84.2	101.6
145	Ilmajoki	0.7	12.9	67.9	108.3	121.0	142.6	167.6	150.0	105.7	106.6
151	Isojoki	1.6	19.1	52.0	85.9	130.6	163.5	153.5	120.1	130.9	104.0
152	Isokyrö	0.4	12.8	63.2	92.0	123.0	167.0	174.4	126.0	106.4	94.7
164	Jalasjärvi	2.2	11.4	62.0	89.2	130.3	146.6	149.2	161.2	117.6	99.0
175	Jurva	0.5	19.7	58.7	106.0	121.8	168.3	156.2	122.4	154.9	107.3
217	Kannus	1.2	13.0	60.3	86.3	119.2	151.3	144.5	135.3	97.0	93.0
218	Karijoki	0.8	18.3	55.4	95.0	129.8	150.5	154.6	158.5	127.5	103.6
232	Kauhajoki	1.1	14.1	46.1	71.5	110.6	149.6	134.8	125.8	106.9	81.6
233	Kauhava	1.0	9.4	55.3	91.6	131.1	144.8	149.7	155.9	117.8	94.2
236	Kaustinen	0.7	12.7	51.5	83.0	110.5	122.5	134.9	135.5	125.1	82.7
281	Kortesjärvi	1.0	9.9	55.1	82.1	131.3	137.3	153.3	158.3	107.8	88.6
300	Kuortane	0.6	9.7	55.1	106.0	130.2	153.5	152.4	170.5	122.9	103.8
301	Kurikka	1.3	11.2	59.7	95.9	126.7	146.1	155.6	154.5	118.5	99.7
315	Kälviä	1.5	14.9	60.0	80.1	111.2	142.4	146.6	137.9	97.3	89.7
399	Laihia	0.3	18.7	67.1	93.9	128.4	182.1	164.6	131.9	147.8	106.1
403	Lappajärvi	1.6	12.8	58.6	91.0	126.1	139.0	148.8	148.0	114.2	96.5
408	Lapua	1.8	11.9	68.7	88.8	119.8	156.4	156.1	167.3	110.8	100.8
414	Lehtimäki	2.7	9.7	60.4	93.5	119.7	121.5	132.7	152.3	99.6	94.8
421	Lestijärvi	1.6	13.2	57.3	76.8	118.4	125.6	140.5	128.5	133.9	84.2
429	Lohtaja	0.8	12.4	58.4	86.9	120.2	141.4	136.5	124.2	94.1	87.1
544	Nurmo	1.6	12.0	59.7	76.9	113.7	138.0	156.3	151.7	95.9	91.3
584	Petro	10.5	7.8	51.7	70.9	115.6	122.9	91.2	140.2	168.4	67.0
743	Seinäjoki	3.2	10.3	60.6	86.7	125.3	136.5	133.0	145.3	120.4	90.9
759	Soini	5.1	10.6	61.6	90.8	138.0	144.2	142.4	149.6	128.6	98.6
846	Teuva	1.0	16.5	52.0	97.3	119.6	152.8	153.9	132.1	132.7	101.0
849	Toholampi	0.6	16.9	63.6	89.3	119.8	141.3	151.4	132.4	104.9	94.1

(continued)

Table 4b (continued)

	Open regene- ration site	1–20 years	21–40 years	41–60 years	61–80 years	81–100 years	101–120 years	121–140 years	141+ years	Forest land total
	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)
863	0.4	11.9	61.1	106.4	137.8	147.2	164.7	169.7	136.4	106.2
885	0.4	16.8	61.4	86.4	110.2	124.1	135.8	153.9	113.3	91.8
924	6.0	13.5	55.4	81.8	125.7	158.7	149.5	144.5	147.4	93.7
934	6.2	11.9	56.4	85.3	133.0	146.5	134.9	141.3	137.7	92.6
942	0.1	17.9	80.0	72.9	139.1	184.6	168.1	170.5	145.3	99.7
971	3.2	12.6	59.8	87.3	139.0	141.2	141.5	150.6	102.0	91.6
975	1.0	13.3	64.6	98.1	130.7	141.7	169.6	141.4	99.7	96.7
989	2.1	12.7	67.2	96.1	129.3	157.2	162.4	178.1	155.1	100.9
Total	1.7	12.7	58.1	86.4	123.9	147.3	149.0	145.4	121.4	93.9
<b>Keski-Suomi</b>										
<i>Municipality</i>										
77	Hankasalmi	4.0	21.3	96.7	152.2	216.5	219.5	187.0	169.4	138.6
172	Joutsa	7.2	30.3	101.0	165.8	221.3	240.4	187.1	162.2	141.1
179	Jyväskylä	4.8	25.8	99.2	156.3	214.8	225.5	179.5	157.5	132.5
180	Jyväskylän mlk	4.0	22.6	96.9	150.3	209.7	226.6	179.4	163.8	134.3
182	Jämsä	5.6	24.0	93.7	150.4	205.3	228.5	186.1	175.4	140.1
183	Jämsänkoski	4.0	21.5	92.6	136.9	192.6	223.8	194.1	152.1	123.3
216	Kannonkoski	3.7	17.8	86.1	118.7	157.9	198.5	168.4	193.4	110.1
226	Karstula	3.1	16.2	74.1	97.6	133.4	188.4	171.5	185.9	97.2
249	Keuruu	3.5	18.2	80.2	114.8	164.2	205.8	200.1	167.6	110.2
256	Kinnula	3.3	13.2	70.1	93.8	121.1	169.7	156.9	175.0	85.2
265	Kivijärvi	2.5	14.0	76.4	105.8	136.4	188.2	167.0	185.1	98.8
275	Konnevesi	3.0	18.9	95.7	145.6	206.6	215.4	179.3	164.7	128.7
277	Korpilahti	5.2	24.3	97.3	154.5	210.2	227.0	175.1	150.1	133.5
291	Kuhmoinen	6.5	24.0	92.9	150.3	199.9	216.9	154.9	165.4	137.2



312	Kyyjärvi	2.1	13.8	60.9	82.7	111.9	146.8	155.2	155.5	164.0	83.0
410	Laukaa	3.4	21.0	97.1	147.7	208.3	222.7	223.2	173.3	164.2	132.2
415	Leivonmäki	4.0	22.8	93.2	129.7	189.6	212.9	225.8	170.0	156.0	132.1
435	Luhanka	7.2	28.0	97.8	159.3	211.5	239.6	226.9	161.6	156.1	133.3
495	Multia	3.4	16.1	79.5	101.9	151.5	190.8	193.9	186.5	186.0	104.1
500	Muurame	4.0	24.0	98.6	153.7	212.1	231.7	226.4	175.0	163.0	130.4
592	Petäjävesi	3.8	20.1	91.6	130.3	186.6	207.3	223.5	181.0	158.4	119.7
601	Pihtipudas	3.6	15.6	77.3	105.9	136.5	173.4	198.7	167.9	179.5	100.5
633	Pylkkönmäki	3.2	15.3	78.4	100.8	143.5	183.6	190.8	174.5	181.7	100.0
729	Saarijärvi	3.3	18.0	89.9	123.3	173.7	207.2	217.9	179.3	198.8	117.6
850	Toivakka	4.4	23.5	96.3	149.7	205.9	219.9	221.7	169.3	164.2	132.4
892	Uurainen	3.4	19.8	90.2	124.4	180.5	202.5	221.9	171.8	166.1	120.9
931	Viitasaari	6.4	17.0	87.3	128.8	174.3	197.1	209.9	183.7	185.2	113.1
992	Äänekoski	2.9	21.2	94.1	135.3	189.6	208.3	214.5	174.7	175.3	125.8
Total		4.1	19.7	87.0	125.6	178.5	207.2	210.5	177.2	174.5	118.4
<b>Pohjois-Savo</b>											
<i>Municipality</i>											
140	Iisalmi	12.7	16.2	77.7	127.2	169.8	216.8	217.5	206.4	192.9	111.3
174	Juankoski	9.2	19.8	84.8	141.2	193.1	229.6	210.2	182.8	206.6	123.7
204	Kaavi	5.3	20.4	83.9	129.2	175.3	222.8	186.6	166.5	203.0	126.5
227	Karttula	6.4	23.3	91.2	140.6	203.6	214.7	203.9	180.9	183.2	126.5
239	Keitele	4.6	16.7	80.7	116.9	162.9	186.4	205.4	181.1	189.9	112.4
263	Kiuruvesi	13.2	17.9	68.7	105.5	129.1	173.1	200.8	209.0	154.6	95.5
297	Kuopio	6.5	23.5	90.5	153.1	218.8	231.4	212.1	189.9	192.1	135.9
402	Lapinlahti	10.9	17.4	79.3	129.0	173.6	209.0	215.1	196.0	194.7	117.8
420	Leppävirta	1.8	23.6	91.5	158.1	227.7	232.5	204.8	189.6	153.1	145.0
476	Maaninka	8.7	19.7	88.0	140.7	201.1	218.7	221.3	191.6	201.1	131.4

(continued)

Table 4b (continued)

	Open regene- ration site	1–20 years	21–40 years	41–60 years	61–80 years	81–100 years	101–120 years	121–140 years	141+ years	Forest land total
	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)
534	12.5	20.8	82.3	139.4	191.1	225.6	220.3	196.6	200.5	123.6
595	10.7	17.8	79.3	121.2	161.8	193.7	211.7	188.1	190.1	113.6
686	2.7	21.6	95.4	147.0	209.8	214.5	208.0	171.1	164.3	124.0
687	8.5	15.9	71.1	110.2	120.4	182.6	165.8	167.3	194.5	98.0
749	8.7	18.1	86.1	145.8	210.2	223.8	222.6	199.1	203.8	122.2
762	10.8	15.6	66.9	105.8	121.5	178.9	167.8	178.1	190.7	93.4
778	2.0	20.7	91.0	144.0	208.6	208.9	202.0	167.0	163.9	133.3
844	8.1	21.4	91.6	140.7	199.1	217.0	215.3	192.3	202.7	122.3
857	3.9	22.6	87.1	146.5	205.9	232.9	191.3	160.8	183.6	123.1
915	5.0	23.7	102.7	158.6	234.4	231.3	225.8	208.4	176.5	138.1
916	12.5	17.6	77.2	127.1	164.6	209.0	210.0	191.0	186.2	114.7
921	4.4	18.6	91.9	135.5	191.9	205.2	213.9	188.2	183.8	119.4
925	11.5	17.3	68.2	105.9	130.8	180.3	178.8	195.6	181.7	93.8
Total	8.3	19.4	81.1	127.3	174.0	208.6	201.4	186.4	184.6	116.8
<b>Pohjois-Karjala</b>										
<i>Municipality</i>										
45	3.3	15.0	82.7	119.1	141.6	202.6	169.5	154.7	183.6	102.7
146	0.4	14.4	77.4	94.5	106.9	146.3	168.1	174.2	187.6	93.5
167	4.8	19.0	98.3	118.3	161.7	196.8	215.9	190.9	167.2	114.9
176	3.0	14.5	78.3	99.0	141.1	160.7	191.4	179.9	168.8	103.2
248	10.3	25.6	114.0	128.6	158.7	185.4	191.7	166.6	201.0	117.5
260	3.8	25.3	106.4	132.2	191.9	224.2	222.5	203.6	196.3	121.8
276	14.6	20.8	88.2	125.9	174.5	215.0	215.9	158.2	139.7	117.7
309	6.6	27.5	111.8	136.9	181.1	164.8	239.5	190.0	252.9	130.1

422	Lieksa	4.5	16.8	78.6	97.0	110.7	156.6	178.0	163.9	185.3	97.0
426	Liperi	24.9	22.8	108.4	148.2	207.9	210.7	204.3	168.3	216.8	121.9
541	Nurmes	1.5	16.0	61.8	94.4	123.2	143.8	183.5	182.8	197.6	92.1
607	Pohvijärvi	9.3	18.9	102.0	121.3	173.3	168.5	214.4	159.6	176.5	114.8
632	Pyhäselkä	6.5	29.4	102.7	139.2	229.7	199.0	231.3	149.8	233.5	120.2
707	Rääkkylä	3.4	22.5	100.8	161.3	217.4	210.3	197.9	176.8	163.6	129.8
848	Tohmajärvi	0.9	24.3	95.4	124.1	164.7	215.5	193.6	154.0	221.6	114.2
911	Valtimo	1.4	14.3	68.9	93.1	117.5	141.7	171.5	169.0	178.4	84.6
Total		5.2	18.5	85.8	108.0	139.2	174.1	191.5	173.1	186.8	104.5
<b>Kainuu</b>											
<i>Municipality</i>											
105	Hyrnsalmi	3.4	13.1	60.4	70.2	76.9	104.9	125.8	170.0	176.4	78.7
205	Kajaani	10.0	14.2	69.6	80.7	91.2	119.2	126.7	148.6	147.4	80.8
290	Kuhmo	4.6	12.6	60.1	72.3	76.4	104.3	147.0	184.0	194.4	83.8
578	Paltamo	11.3	12.7	71.0	86.9	100.5	122.3	140.6	174.0	167.6	85.6
620	Puolanka	4.5	11.8	53.4	61.6	71.2	95.9	123.8	153.4	168.4	73.2
697	Ristijärvi	4.5	12.7	63.7	79.1	84.3	112.1	135.0	178.0	181.1	81.8
765	Sotkamo	5.7	13.6	72.4	86.6	90.7	117.8	142.1	187.4	181.8	85.1
777	Suomussalmi	3.0	12.3	50.6	57.9	62.9	95.1	116.6	154.7	164.1	72.4
785	Vaala	22.1	12.4	51.7	64.3	87.5	105.4	127.2	102.6	121.4	73.8
Total		6.2	12.7	60.0	71.6	79.0	105.2	131.3	167.1	173.9	78.9
<b>Pohjois-Pohjanmaa</b>											
<i>Municipality</i>											
9	Alavieska	2.4	13.6	58.0	82.4	114.2	127.4	130.5	149.8	116.8	88.3
69	Haapajärvi	3.5	16.9	70.7	100.3	116.6	147.5	134.7	150.1	132.0	98.2
71	Haapavesi	3.2	16.2	60.8	92.0	113.0	136.6	143.3	162.8	129.6	96.9
72	Hailuoto	7.6	10.3	52.0	79.9	120.0	113.0	128.1	100.1	108.5	76.4
84	Haukipudas	4.7	13.4	53.8	84.7	108.8	119.2	121.3	107.5	120.1	81.7

(continued)

Table 4b (continued)

	Open rege- ration site (m <sup>2</sup> /ha)	1–20 years (m <sup>2</sup> /ha)	21–40 years (m <sup>2</sup> /ha)	41–60 years (m <sup>2</sup> /ha)	61–80 years (m <sup>2</sup> /ha)	81–100 years (m <sup>2</sup> /ha)	101–120 years (m <sup>2</sup> /ha)	121–140 years (m <sup>2</sup> /ha)	141+ years (m <sup>2</sup> /ha)	Forest land total (m <sup>2</sup> /ha)	
139	Ii	4.3	12.7	54.2	82.4	95.7	111.7	116.0	118.4	102.4	79.7
208	Kalajoki	1.2	14.5	54.0	83.1	105.3	116.9	113.8	82.0	135.8	78.7
244	Kempele	2.2	12.1	56.3	80.9	94.8	114.7	123.8	85.3	95.8	78.1
247	Kestilä	11.7	12.0	56.3	69.6	92.4	115.1	114.0	112.8	125.0	80.6
255	Kiiminki	5.5	14.1	56.5	87.0	105.2	116.1	134.2	112.1	123.3	86.5
305	Kuusamo	4.9	11.0	50.5	59.2	80.7	83.1	101.8	126.3	126.4	68.6
317	Kärsämäki	4.6	14.3	64.7	90.0	112.2	137.5	138.9	146.8	161.7	95.5
425	Liminka	0.6	13.1	47.9	72.2	95.1	101.2	108.8	83.6	116.4	73.0
436	Lumijoki	3.1	13.4	61.1	89.0	109.8	111.3	126.6	105.6	89.9	81.1
483	Merijärvi	2.5	16.8	63.9	91.6	112.5	132.7	138.5	143.3	112.4	96.3
494	Muho	2.9	11.3	44.8	69.0	91.4	101.9	123.7	86.4	128.5	73.3
535	Nivala	2.9	14.7	62.8	102.0	134.3	130.3	140.3	144.2	133.7	97.6
563	Oulainen	2.6	12.3	56.4	92.3	116.3	118.8	131.1	136.6	120.4	90.2
564	Oulu	4.7	13.7	61.9	89.8	111.9	123.7	131.5	114.5	110.4	92.0
567	Oulunsalo	1.1	12.2	56.2	83.8	102.2	118.3	129.1	98.3	100.0	83.8
603	Püppöla	8.5	12.6	60.6	81.2	99.2	121.4	116.3	132.4	120.7	86.5
615	Pudasjärvi	6.5	11.6	53.2	60.1	72.1	88.0	98.3	125.9	135.9	67.7
617	Pulkila	5.4	11.4	62.0	84.9	105.7	126.3	124.7	134.5	129.2	92.4
625	Pyhäjoki	1.0	16.9	57.4	87.8	111.1	120.8	123.5	111.6	142.7	84.1
626	Pyhäsalmi	3.7	17.7	67.7	100.5	106.6	131.3	107.2	154.0	137.8	89.6
630	Pyhäntä	19.6	13.2	63.1	71.5	89.4	114.3	117.4	131.3	139.1	83.8
678	Raabe	0.3	14.0	61.2	91.1	112.1	120.2	142.6	119.8	98.7	90.1
682	Rantsila	5.4	10.9	52.1	70.3	93.8	114.3	116.6	111.9	112.0	80.7
691	Reisjärvi	1.1	12.0	77.0	96.5	107.0	147.2	133.8	120.5	117.5	87.7
746	Sievi	1.2	9.8	67.3	82.7	106.6	126.5	116.3	92.7	133.7	82.5
748	Siikajoki	1.9	10.9	55.6	79.7	97.6	112.9	130.2	103.5	98.0	80.9

832	Taivalkoski	7.1	11.0	58.4	59.7	76.8	87.0	104.4	133.1	141.0	71.9
859	Tyrnävä	0.2	12.2	43.0	68.0	89.0	99.0	107.1	77.6	116.2	70.8
889	Urajärvi	2.6	11.0	57.8	68.1	79.5	96.2	113.2	101.7	166.1	75.8
926	Vihanti	1.6	12.1	56.8	81.1	102.6	122.3	132.9	133.6	118.3	86.7
972	Yli-Ii	4.5	12.7	47.9	69.7	81.8	101.2	108.8	114.7	108.7	71.7
973	Ylikiminki	1.7	11.7	53.8	82.6	91.7	106.7	129.1	105.8	98.1	82.8
977	Ylivieska	2.7	11.5	59.8	87.1	116.0	121.2	127.4	141.2	114.3	86.8
	Total	4.0	12.4	56.6	75.4	93.6	110.4	117.4	123.7	131.0	78.7
<b>Lapland</b>											
<i>Municipality</i>											
47	Enontekiö	8.2	14.3	19.0	40.8	38.0	48.3	73.0	50.1	79.7	54.9
148	Inari	12.5	11.8	18.9	38.8	56.6	55.4	62.1	62.1	86.4	64.5
240	Kemi	7.8	16.1	76.5	64.1	90.1	146.1	109.7	132.5	151.2	70.3
241	Keminmaa	9.0	12.7	59.5	67.3	92.0	133.0	108.8	121.7	121.6	73.4
261	Kitilä	13.0	13.1	37.9	44.7	49.3	66.5	71.1	63.5	81.4	54.3
273	Kolari	13.1	15.6	39.7	48.3	61.9	77.7	87.4	92.3	91.2	61.3
320	Kemijärvi	10.2	13.4	44.9	54.1	59.6	80.7	82.5	88.5	95.4	59.9
498	Muonio	4.4	17.4	35.6	49.1	51.6	73.3	84.6	62.9	98.2	65.2
583	Pelkosenniemi	10.2	12.9	48.5	58.5	62.0	74.7	91.7	91.1	91.2	59.4
614	Posio	7.6	11.1	46.4	58.9	69.1	71.7	85.5	101.7	106.2	64.2
683	Ranua	12.1	13.8	41.3	51.6	61.8	77.9	91.2	91.7	89.1	54.3
698	Rovaniemi	12.8	15.1	36.9	51.2	61.1	79.0	92.8	94.5	91.9	58.9
732	Salla	8.5	12.2	48.0	59.8	65.0	76.5	81.1	102.8	87.0	62.2
742	Savukoski	13.0	12.0	39.6	52.7	59.4	72.8	79.2	66.6	78.7	58.4
751	Simo	4.4	12.7	60.5	68.4	73.8	94.5	101.4	126.5	102.5	71.7
758	Sodankylä	13.3	12.1	33.6	41.6	50.4	59.2	67.0	68.5	76.9	54.1
845	Tervola	5.1	12.9	50.4	55.7	74.9	96.7	116.2	97.1	103.6	68.6

(continued)

Table 4b (continued)

	Open regene- ration site	1–20 years	21–40 years	41–60 years	61–80 years	81–100 years	101–120 years	121–140 years	141+ years	Forest land total
	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)	(m <sup>3</sup> /ha)
851	Tornio	7.5	14.5	51.7	68.3	94.4	118.4	114.5	119.8	71.8
854	Pello	16.1	15.0	39.7	53.2	65.1	83.3	95.8	92.9	60.0
890	Utsjoki	–	10.6	44.0	71.7	41.9	21.4	51.9	62.2	53.9
976	Ylitornio	6.9	13.6	43.4	55.7	65.4	86.1	92.3	102.2	62.3
Total		11.4	13.3	40.3	51.3	59.6	71.0	81.3	85.6	60.0

**Table 5a** Development class distribution on forest land (By forestry centres).

	Open regeneration site		Young seedling stand		Advanced seedling stand		Young thinning stand		Advanced thinning stand		Mature stand		Shelter-wood stand		Seed tree stand		Forest land total	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
<b>Åland</b>																		
<i>Municipality</i>																		
35 Brändö	34	1.2	21	0.7	278	9.6	312	10.8	857	29.5	1,398	48.2	1	0.0	-	-	2,901	100.0
43 Eckerö	52	0.9	209	3.8	862	15.6	1,099	19.9	1,532	27.8	1,548	28.1	158	2.9	55	1.0	5,515	100.0
60 Finström	13	0.2	313	4.9	1,194	18.9	1,305	20.6	1,781	28.1	1,532	24.2	145	2.3	48	0.8	6,330	100.0
62 Föglö	0	0.0	164	2.7	957	15.4	983	15.9	2,041	32.9	1,819	29.4	181	2.9	52	0.8	6,196	100.0
65 Geta	5	0.2	132	4.0	554	16.7	613	18.5	1,002	30.1	869	26.1	111	3.3	37	1.1	3,323	100.0
76 Hammarland	19	0.3	244	3.5	1,189	17.1	1,502	21.6	2,027	29.2	1,740	25.0	180	2.6	52	0.7	6,953	100.0
170 Jomala	33	0.4	368	4.9	1,287	17.0	1,623	21.5	2,061	27.3	1,971	26.1	156	2.1	52	0.7	7,551	100.0
295 Kumlinge	9	0.3	70	2.2	539	16.7	355	11.0	1,073	33.3	1,090	33.8	83	2.6	6	0.2	3,225	100.0
318 Kökar	-	-	96	7.3	278	21.4	188	14.4	495	38.0	191	14.7	52	4.0	3	0.2	1,304	100.0
417 Lemland	34	0.5	254	4.0	1,197	18.9	1,355	21.3	1,784	28.1	1,535	24.2	153	2.4	37	0.6	6,350	100.0
438 Lumparland	4	0.2	60	3.5	256	15.1	293	17.3	517	30.5	507	29.9	39	2.3	16	1.0	1,693	100.0
478 Mariehamn	5	1.1	35	7.5	107	23.2	87	19.0	119	25.9	90	19.6	13	2.8	4	0.8	459	100.0
736 Saltvik	14	0.2	184	3.0	880	14.1	1,095	17.6	1,962	31.5	1,870	30.0	177	2.8	49	0.8	6,231	100.0
766 Sottunga	1	0.2	35	3.9	197	22.5	109	12.4	268	30.7	223	25.5	39	4.4	3	0.3	874	100.0
771 Sund	13	0.2	199	3.9	831	16.1	1,038	20.1	1,484	28.8	1,431	27.8	131	2.5	30	0.6	5,157	100.0
941 Vårdö	11	0.3	110	2.9	591	15.8	596	16.0	1,159	31.0	1,120	30.0	108	2.9	38	1.0	3,732	100.0
Total	241	0.4	2,500	3.7	11,197	16.5	12,554	18.5	20,162	29.7	18,932	27.9	1,727	2.5	481	0.7	67,794	100.0
<b>Ramnikko/Etelärannikko</b>																		
<i>Municipality</i>																		
40 Dragsfjärd	103	0.7	650	4.3	1,495	9.9	2,363	15.7	5,959	39.5	4,266	28.3	112	0.7	143	1.0	15,092	100.0
49 Espoo-Esbo	4	0.0	512	3.4	1,457	9.6	3,965	26.0	4,936	32.4	3,969	26.0	135	0.9	278	1.8	15,256	100.0
78 Hanko-Hangö	7	0.1	206	3.0	526	7.7	2,316	33.8	2,597	37.9	992	14.5	113	1.7	89	1.3	6,845	100.0

(continued)

Table 5a (continued)

	Open regeneration site		Young seedling stand		Advanced seedling stand		Young thinning stand		Advanced thinning stand		Mature stand		Shelter-wood stand		Seed tree stand		Forest land total		
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
91	36	0.6	349	5.4	1,222	18.7	1,835	28.1	1,597	24.5	1,152	17.7	125	1.9	210	3.2	6,526	100.0	
Helsingfors																			
92	45	0.5	396	3.9	1,586	15.7	2,949	29.2	3,096	30.6	1,830	18.1	94	0.9	117	1.2	10,113	100.0	
101	–	–	264	3.9	847	12.5	1,149	16.9	1,424	21.0	2,562	37.8	4	0.1	533	7.9	6,782	100.0	
Houtskari																			
149	229	1.3	865	5.0	1,567	9.0	3,314	19.1	6,046	34.8	4,496	25.9	85	0.5	769	4.4	17,372	100.0	
150	–	–	110	3.0	326	8.8	549	14.9	1,141	30.9	1,375	37.3	3	0.1	189	5.1	3,692	100.0	
220	170	1.5	676	6.0	1,437	12.7	3,046	27.0	3,747	33.2	1,943	17.2	58	0.5	217	1.9	11,293	100.0	
235	–	–	7	3.4	19	9.3	57	28.4	63	31.3	50	24.9	2	0.9	4	1.8	201	100.0	
Grankulla																			
243	57	0.3	812	4.7	1,593	9.2	3,175	18.3	7,063	40.6	4,066	23.4	208	1.2	415	2.4	17,390	100.0	
257	71	0.4	1,063	5.7	1,789	9.6	4,071	21.8	5,896	31.5	4,726	25.3	150	0.8	947	5.1	18,714	100.0	
Kyrkölätt																			
279	0	0.0	380	4.5	1,301	15.5	1,138	13.6	2,743	32.7	2,398	28.6	24	0.3	416	5.0	8,400	100.0	
407	104	0.6	573	3.3	1,162	6.7	6,199	36.0	5,786	33.6	3,117	18.1	67	0.4	232	1.4	17,240	100.0	
Lapträsk																			
424	32	0.6	161	2.8	427	7.4	2,102	36.5	1,903	33.1	1,005	17.5	32	0.6	96	1.7	5,759	100.0	
434	6	0.2	86	3.1	207	7.6	986	35.9	811	29.5	600	21.9	2	0.1	49	1.8	2,747	100.0	
533	0	0.0	507	3.9	1,275	9.8	1,861	14.3	5,911	45.5	2,930	22.5	105	0.8	416	3.2	13,006	100.0	
573	28	0.2	825	5.7	1,444	9.9	2,383	16.4	5,504	37.8	3,595	24.7	365	2.5	410	2.8	14,554	100.0	
585	276	1.1	1,199	4.6	2,693	10.4	8,983	34.8	7,721	29.9	4,497	17.4	63	0.2	392	1.5	25,824	100.0	
606	76	0.5	468	3.1	1,974	13.3	5,357	36.0	4,222	28.3	2,586	17.4	92	0.6	123	0.8	14,898	100.0	
638	254	0.7	2,187	6.0	5,047	13.9	10,564	29.0	12,179	33.4	5,627	15.5	133	0.4	439	1.2	36,430	100.0	
701	124	0.8	759	4.7	1,387	8.6	6,514	40.6	4,328	27.0	2,648	16.5	18	0.1	280	1.8	16,058	100.0	
Strömfors																			
753	175	0.9	1,108	5.7	2,630	13.4	5,306	27.1	6,711	34.3	3,317	16.9	171	0.9	172	0.9	19,591	100.0	



755	Stuntio-Sjundeå	60	0.5	473	3.8	1,433	11.6	2,904	23.4	3,815	30.7	3,216	25.9	114	0.9	396	3.2	12,412	100.0
835	Ekenäs-Tammisaari	132	0.3	1,800	4.1	4,896	11.2	12,701	29.0	14,022	32.0	8,759	20.0	479	1.1	978	2.2	43,767	100.0
923	Västanfjärd	23	0.4	321	5.6	519	9.1	1,008	17.7	2,129	37.3	1,436	25.2	113	2.0	154	2.7	5,701	100.0
Total		2,012	0.6	16,756	4.6	40,261	11.0	96,795	26.5	121,349	33.2	77,160	21.1	2,867	0.8	8,463	2.3	365,663	100.0
<b>Rannikko/Pohjanmaa</b>																			
<i>Municipality</i>																			
231	Kaskinen-Kaskö	3	0.5	56	8.6	98	15.1	183	28.4	174	26.9	132	20.5	-	-	0	0.0	646	100.0
272	Kokkola-Karleby	226	1.1	1,415	6.8	4,115	19.7	6,832	32.7	4,664	22.3	3,392	16.2	7	0.0	233	1.1	20,883	100.0
280	Korsnäs	277	1.6	1,132	6.5	2,702	15.5	5,874	33.7	4,002	23.0	3,363	19.3	35	0.2	35	0.2	17,422	100.0
287	Kristinestad-Kristinan	289	0.6	2,196	4.6	6,604	13.9	12,760	26.9	15,571	32.8	9,692	20.4	106	0.2	291	0.6	47,508	100.0
288	Kronoby-kaupunki	442	0.9	2,864	5.9	8,831	18.1	17,390	35.6	11,593	23.8	7,272	14.9	31	0.1	388	0.8	48,811	100.0
440	Larsmo-Luoto	162	1.7	899	9.2	2,364	24.3	2,671	27.5	1,894	19.5	1,596	16.4	7	0.1	136	1.4	9,729	100.0
475	Malax-Maalampi	623	1.8	2,277	6.5	6,620	18.8	12,433	35.2	7,279	20.6	5,884	16.7	43	0.1	149	0.4	35,308	100.0
499	Korsholm-Mustasaari	571	1.1	3,556	6.6	9,057	16.8	15,967	29.6	13,439	24.9	10,975	20.3	42	0.1	343	0.6	53,950	100.0
545	Närpes-Närpiö	459	0.7	3,552	5.5	9,784	15.2	17,639	27.5	19,722	30.7	12,476	19.4	113	0.2	492	0.8	64,237	100.0
559	Oravais-Oravainen	295	2.3	831	6.6	2,333	18.4	3,921	31.0	2,643	20.9	2,437	19.3	61	0.5	135	1.1	12,657	100.0
598	Jakobstad-Pietarsaari	145	2.6	374	6.7	1,101	19.8	1,703	30.7	1,257	22.6	887	16.0	27	0.5	59	1.1	5,554	100.0
599	Pedersöre-Pedersören	787	1.5	3,132	5.8	9,863	18.2	19,853	36.6	11,764	21.7	8,325	15.4	145	0.3	366	0.7	54,234	100.0
893	Nykarleby-kunta	1,110	2.3	2,998	6.1	8,743	17.9	17,734	36.3	10,004	20.5	7,656	15.7	223	0.5	385	0.8	48,853	100.0
	Uusikaarlepyy																		

(continued)



304	Kustavi	26	0.3	221	2.4	835	9.2	1,165	12.8	4,564	50.3	1,995	22.0	30	0.3	239	2.6	9,075	100.0
308	Kuusjoki	43	0.9	171	3.7	456	9.8	1,156	24.8	1,598	34.2	1,168	25.0	15	0.3	61	1.3	4,667	100.0
319	Köyliö	308	2.1	798	5.4	1,459	9.9	4,242	28.8	4,812	32.7	2,617	17.8	125	0.9	366	2.5	14,728	100.0
400	Laitila	291	0.9	1,772	5.5	3,446	10.6	10,056	31.0	10,071	31.1	5,955	18.4	279	0.9	549	1.7	32,419	100.0
406	Lappi	150	1.1	722	5.4	1,511	11.3	3,983	29.8	4,193	31.4	2,414	18.1	98	0.7	306	2.3	13,377	100.0
413	Lavia	418	1.8	1,149	5.0	3,089	13.4	8,746	38.0	6,051	26.3	3,189	13.8	135	0.6	259	1.1	23,035	100.0
419	Lemu	20	1.1	164	9.1	229	12.7	412	23.0	567	31.6	337	18.8	27	1.5	41	2.3	1,796	100.0
423	Lieto	69	0.8	474	5.4	890	10.1	2,109	23.8	2,896	32.7	2,193	24.8	44	0.5	174	2.0	8,849	100.0
430	Loimaa	272	1.5	869	4.9	1,755	9.9	4,739	26.6	6,129	34.4	3,616	20.3	104	0.6	326	1.8	17,811	100.0
442	Luvia	174	1.5	567	4.8	1,279	10.8	3,543	29.8	3,864	32.5	2,135	18.0	109	0.9	213	1.8	11,884	100.0
480	Marttila	114	1.3	420	4.6	980	10.8	2,493	27.4	2,919	32.1	1,970	21.6	38	0.4	167	1.8	9,100	100.0
481	Masku	42	1.0	243	5.7	482	11.3	1,086	25.5	1,391	32.6	881	20.7	47	1.1	92	2.2	4,264	100.0
482	Mellilä	63	1.8	199	5.6	378	10.6	1,078	30.2	1,108	31.1	644	18.0	22	0.6	77	2.1	3,567	100.0
484	Merikarvia	614	1.9	1,979	6.1	5,126	15.8	12,314	38.0	7,821	24.1	3,972	12.2	273	0.8	346	1.1	32,445	100.0
485	Merimasku	4	0.1	57	2.2	257	9.7	333	12.5	1,281	48.2	679	25.5	11	0.4	36	1.4	2,657	100.0
501	Muurila	33	0.8	186	4.5	465	11.2	976	23.5	1,465	35.3	943	22.7	13	0.3	75	1.8	4,156	100.0
503	Mynämäki	428	1.4	1,804	5.8	3,571	11.4	9,413	30.1	9,622	30.8	5,324	17.0	290	0.9	789	2.5	31,242	100.0
529	Naantali	10	0.4	102	4.3	271	11.4	380	16.1	990	41.8	544	22.9	33	1.4	41	1.7	2,371	100.0
531	Nakkila	187	2.1	541	6.2	1,030	11.8	2,891	33.1	2,705	31.0	1,149	13.2	60	0.7	168	1.9	8,730	100.0
537	Noormarkku	412	1.7	1,496	6.1	3,203	13.1	7,329	30.0	7,097	29.1	4,368	17.9	236	1.0	282	1.2	24,421	100.0
538	Nousiainen	150	1.4	559	5.2	989	9.2	2,698	25.0	3,587	33.3	2,438	22.6	86	0.8	275	2.6	10,782	100.0
561	Oripää	87	1.6	271	4.9	555	10.0	1,496	26.9	1,782	32.1	1,224	22.0	35	0.6	107	1.9	5,558	100.0
577	Paimio	50	0.5	580	5.2	1,234	11.1	2,476	22.2	4,303	38.6	2,184	19.6	127	1.1	191	1.7	11,144	100.0
586	Perniö	161	0.7	874	3.8	2,224	9.6	5,259	22.8	8,671	37.5	5,427	23.5	91	0.4	415	1.8	23,117	100.0
587	Pertteli	53	0.8	321	4.8	720	10.9	1,575	23.8	2,233	33.7	1,580	23.8	23	0.3	122	1.8	6,626	100.0
602	Piikkiö	18	0.5	228	6.0	453	11.9	790	20.7	1,427	37.4	769	20.2	53	1.4	76	2.0	3,813	100.0
608	Pomarkku	291	1.3	936	4.1	2,397	10.6	6,662	29.3	7,254	32.0	4,809	21.2	188	0.8	169	0.8	22,706	100.0
609	Pori	547	1.9	1,984	7.0	4,362	15.5	8,411	29.8	7,276	25.8	4,975	17.6	274	1.0	391	1.4	28,219	100.0
631	Pyhäranta	59	0.6	568	5.9	946	9.9	2,556	26.7	3,368	35.2	1,905	19.9	44	0.5	137	1.4	9,582	100.0
636	Pöytyä	266	1.3	1,004	4.9	2,138	10.4	5,516	26.9	6,421	31.3	4,702	22.9	109	0.5	369	1.8	20,526	100.0
680	Raisio	18	1.0	133	7.2	236	12.8	390	21.1	638	34.5	366	19.8	25	1.4	44	2.4	1,852	100.0
684	Rauma	123	0.7	1,006	5.6	2,099	11.7	5,124	28.6	5,881	32.9	3,238	18.1	113	0.6	320	1.8	17,904	100.0

(continued)

Table 5a (continued)

	Open regeneration site		Young seedling stand		Advanced seedling stand		Young thinning stand		Advanced thinning stand		Mature stand		Shelter-wood stand		Seed tree stand		Forest land total		
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
704	Rusko	22	1.0	125	5.5	241	10.6	611	27.0	749	33.1	449	19.8	21	0.9	44	2.0	2,262	100.0
705	Rymättylä	18	0.3	197	2.8	642	9.0	869	12.1	3,460	48.3	1,737	24.2	50	0.7	189	2.6	7,163	100.0
734	Salo	54	0.7	393	5.3	890	12.0	1,859	25.1	2,536	34.3	1,508	20.4	32	0.4	131	1.8	7,403	100.0
738	Sauvo	101	0.8	776	6.5	1,517	12.7	2,836	23.7	4,107	34.4	2,143	17.9	190	1.6	276	2.3	11,946	100.0
747	Siikainen	628	1.9	1,834	5.4	4,573	13.5	13,434	39.6	8,828	26.0	4,080	12.0	161	0.5	390	1.2	33,928	100.0
761	Somero	382	1.2	1,441	4.3	3,802	11.5	9,177	27.7	11,161	33.6	6,595	19.9	145	0.4	471	1.4	33,174	100.0
776	Suomusjärvi	155	1.4	615	5.6	1,336	12.2	2,579	23.6	3,520	32.2	2,443	22.4	57	0.5	222	2.0	10,927	100.0
783	Säkylä	179	1.9	479	5.0	872	9.0	2,614	27.1	3,199	33.2	1,941	20.1	79	0.8	283	2.9	9,646	100.0
784	Särkisalo-Finby	23	0.4	211	4.0	622	11.7	1,257	23.7	1,975	37.2	1,108	20.9	39	0.7	79	1.5	5,314	100.0
833	Taivassalo	17	0.3	215	3.5	653	10.5	819	13.2	2,912	46.9	1,430	23.0	67	1.1	103	1.7	6,217	100.0
838	Tarvasjoki	40	0.9	207	4.8	503	11.6	1,133	26.0	1,410	32.4	980	22.5	18	0.4	65	1.5	4,357	100.0
853	Turku-Åbo	87	1.0	553	6.3	1,177	13.4	1,991	22.6	2,972	33.8	1,716	19.5	117	1.3	190	2.2	8,802	100.0
886	Ulvila	545	2.0	1,563	5.7	3,422	12.5	9,466	34.6	7,784	28.5	4,059	14.8	157	0.6	368	1.4	27,364	100.0
895	Uusikaupunki	376	1.3	1,877	6.6	3,706	13.0	7,520	26.5	8,410	29.6	5,460	19.2	369	1.3	694	2.4	28,411	100.0
906	Vahto	55	1.3	195	4.7	412	9.9	1,121	26.8	1,390	33.3	882	21.1	35	0.8	86	2.1	4,177	100.0
913	Vampula	114	1.7	300	4.5	660	9.8	1,845	27.4	2,437	36.2	1,253	18.6	17	0.3	106	1.6	6,733	100.0
918	Vehmaa	72	0.8	709	7.7	1,276	13.9	2,184	23.8	2,939	32.1	1,586	17.3	194	2.1	207	2.3	9,167	100.0
920	Velkua	3	0.2	39	2.3	122	7.2	175	10.4	930	55.2	356	21.2	1	0.1	58	3.4	1,684	100.0
979	Yläne	280	1.2	1,045	4.4	2,499	10.5	6,962	29.3	7,798	32.8	4,420	18.6	222	0.9	536	2.3	23,763	100.0
Total		12,984	1.3	50,101	5.1	114,189	11.7	297,033	30.4	305,889	31.4	171,623	17.6	6,890	0.7	17,169	1.8	975,878	100.0
<b>Häme-Uusimaa Municipality</b>																			
15	Artjärvi	14	0.2	569	6.0	1,129	11.9	2,898	30.7	2,188	23.1	2,260	23.9	145	1.5	251	2.7	9,454	100.0
16	Asikkala	157	0.4	2,284	5.3	7,965	18.5	8,537	19.9	16,059	37.4	7,117	16.6	512	1.2	370	0.9	43,000	100.0
18	Askola	164	1.4	396	3.3	1,164	9.6	3,438	28.3	3,325	27.3	3,102	25.5	169	1.4	402	3.3	12,160	100.0
61	Forssa	129	0.9	981	7.1	1,901	13.8	3,027	22.0	5,284	38.4	2,260	16.4	82	0.6	86	0.6	13,752	100.0

81	Hartola	109	0.3	2,911	6.6	7,249	16.5	11,251	25.6	15,675	35.7	6,439	14.7	165	0.4	143	0.3	43,942	100.0
82	Hatula	356	1.4	2,078	8.2	3,787	15.0	6,353	25.1	9,300	36.7	3,145	12.4	128	0.5	175	0.7	25,321	100.0
83	Hauho	371	1.5	1,670	6.8	2,534	10.3	5,423	22.1	10,628	43.2	3,871	15.8	44	0.2	36	0.2	24,577	100.0
86	Hausjärvi	255	1.3	1,315	6.6	2,808	14.0	5,486	27.3	6,276	31.3	3,446	17.2	296	1.5	185	0.9	20,066	100.0
98	Hollola	328	1.1	1,881	6.3	5,455	18.4	7,583	25.5	8,910	30.0	4,931	16.6	318	1.1	309	1.0	29,714	100.0
103	Humppila	91	1.3	439	6.1	504	7.0	1,744	24.3	3,057	42.6	1,096	15.3	254	3.5	0	0.0	7,185	100.0
106	Hyinkää	189	1.0	1,002	5.2	2,518	13.0	5,422	27.9	6,691	34.4	3,039	15.6	287	1.5	292	1.5	19,441	100.0
109	Hämeenlinna	122	1.1	875	8.2	1,473	13.7	3,006	28.0	3,787	35.3	1,412	13.2	38	0.4	19	0.2	10,732	100.0
111	Heinola	116	0.2	3,086	5.4	9,945	17.5	15,506	27.3	15,994	28.1	10,577	18.6	1,248	2.2	389	0.7	56,862	100.0
165	Janakkala	552	1.6	2,386	7.1	3,780	11.3	9,208	27.4	12,208	36.3	5,141	15.3	183	0.6	136	0.4	33,594	100.0
169	Jokioinen	104	1.3	690	8.6	769	9.6	1,677	20.9	3,296	41.1	1,394	17.4	71	0.9	21	0.3	8,022	100.0
186	Järvenpää	23	1.5	76	5.1	366	24.5	425	28.4	378	25.3	190	12.7	23	1.5	16	1.1	1,497	100.0
210	Kalvola	230	1.0	1,483	6.6	3,589	16.1	6,109	27.4	7,502	33.6	3,033	13.6	145	0.7	227	1.0	22,318	100.0
223	Karjalohja	155	2.0	453	6.0	1,201	15.8	2,168	28.5	2,316	30.4	1,254	16.5	-	-	65	0.9	7,612	100.0
224	Karkkila	88	0.5	972	6.0	1,840	11.4	3,882	24.0	6,168	38.1	2,936	18.1	160	1.0	160	1.0	16,205	100.0
245	Kerava	6	0.4	73	5.0	316	21.7	441	30.2	375	25.7	210	14.4	24	1.6	14	0.9	1,459	100.0
283	Hämeenkoski	145	1.2	705	5.9	1,877	15.7	3,452	29.0	4,091	34.3	1,569	13.2	71	0.6	16	0.1	11,927	100.0
316	Kärkölä	150	1.1	725	5.3	2,070	15.2	3,902	28.7	4,254	31.3	2,268	16.7	103	0.8	135	1.0	13,607	100.0
398	Lahti	19	0.2	481	6.1	1,848	23.3	1,918	24.2	2,051	25.9	1,301	16.4	130	1.6	174	2.2	7,922	100.0
401	Lammni	496	1.3	2,508	6.4	5,628	14.3	10,903	27.8	13,836	35.3	5,542	14.1	273	0.7	57	0.2	39,244	100.0
433	Loppi	334	0.8	2,749	6.6	4,677	11.3	10,640	25.6	16,038	38.6	6,404	15.4	310	0.8	406	1.0	41,559	100.0
444	Lohja-Lojo	125	0.8	674	4.2	2,171	13.4	4,406	27.2	5,080	31.4	3,391	21.0	56	0.4	279	1.7	16,183	100.0
504	Myrskylä-	88	0.7	498	4.0	1,235	10.0	3,946	31.9	3,198	25.9	2,951	23.9	129	1.0	321	2.6	12,366	100.0
Mörskom																			
505	Mäntsälä	395	1.2	1,442	4.3	4,104	12.3	8,908	26.7	10,918	32.8	6,630	19.9	365	1.1	569	1.7	33,332	100.0
532	Nastola	151	0.7	1,933	8.5	4,083	18.0	5,322	23.5	6,608	29.1	4,081	18.0	344	1.5	151	0.7	22,673	100.0
540	Nummi-Pusula	270	0.9	1,865	6.3	4,373	14.8	7,860	26.6	10,599	35.9	4,306	14.6	81	0.3	206	0.7	29,559	100.0
543	Nurmijärvi	47	0.3	776	4.4	2,727	15.3	4,938	27.7	5,974	33.5	2,811	15.8	244	1.4	318	1.8	17,836	100.0
560	Orimattila	235	0.7	2,543	7.3	5,736	16.5	9,115	26.2	8,629	24.8	6,896	19.8	581	1.7	1,068	3.1	34,803	100.0
576	Padasjoki	241	0.5	2,531	5.7	6,565	14.8	9,088	20.5	16,802	37.8	8,310	18.7	668	1.5	214	0.5	44,419	100.0
611	Pornainen	137	1.6	337	4.0	1,228	14.4	2,665	31.3	2,179	25.6	1,634	19.2	162	1.9	181	2.1	8,523	100.0
616	Pukkila	90	1.2	387	5.2	1,177	15.8	2,248	30.1	1,819	24.4	1,444	19.3	97	1.3	201	2.7	7,463	100.0

(continued)

Table 5a (continued)

	Open regeneration site			Young seedling stand			Advanced seedling stand			Young thinning stand			Advanced thinning stand			Mature stand			Shelter-wood stand			Seed tree stand			Forest land total		
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	
692 Renko	109	0.6	1,488	7.9	2,184	11.6	4,317	22.9	7,384	39.1	3,194	16.9	76	0.4	127	0.7	18,879	100.0									
694 Riihimäki	64	1.0	406	6.0	943	14.0	1,845	27.5	2,254	33.5	1,023	15.2	91	1.4	95	1.4	6,719	100.0									
737 Sammatti	101	2.3	269	6.0	732	16.4	1,258	28.1	1,415	31.6	659	14.7	4	0.1	39	0.9	4,475	100.0									
781 Sysmä	205	0.4	2,829	5.4	8,549	16.4	11,014	21.1	21,281	40.7	7,693	14.7	489	0.9	174	0.3	52,235	100.0									
834 Tammela	215	0.5	2,592	5.9	6,096	13.9	10,614	24.3	17,072	39.0	6,760	15.4	143	0.3	284	0.7	43,777	100.0									
855 Tuulos	214	1.8	1,087	9.1	1,528	12.7	3,000	25.0	4,496	37.5	1,640	13.7	22	0.2	11	0.1	11,998	100.0									
858 Tuusula	88	0.8	454	4.3	1,799	17.1	3,125	29.6	3,242	30.7	1,640	15.5	101	1.0	104	1.0	10,554	100.0									
927 Vihti	61	0.2	1,097	3.4	3,366	10.5	8,826	27.6	11,444	35.8	6,491	20.3	322	1.0	403	1.3	32,009	100.0									
981 Ypäjä	62	0.8	490	6.2	681	8.6	1,660	21.0	3,720	46.9	1,136	14.3	175	2.2	0	0.0	7,925	100.0									
Total	7,601	0.8	56,487	6.0	135,670	14.5	238,552	25.5	323,804	34.6	156,626	16.7	9,331	1.0	8,828	0.9	936,899	100.0									
<b>Kaakkoi-Suomi</b>																											
<i>Municipality</i>																											
44 Elimäki	243	1.3	1,237	6.4	2,862	14.7	5,219	26.9	5,526	28.4	3,883	20.0	188	1.0	282	1.5	19,440	100.0									
75 Hamina	485	1.1	2,814	6.4	6,266	14.3	14,729	33.7	10,954	25.0	7,646	17.5	206	0.5	669	1.5	43,769	100.0									
142 Iitti	404	1.0	2,159	5.5	6,609	16.8	12,148	30.8	10,254	26.0	6,987	17.7	294	0.7	605	1.5	39,462	100.0									
153 Imatra	156	1.6	739	7.7	1,237	12.9	3,017	31.5	2,772	29.0	1,503	15.7	17	0.2	124	1.3	9,564	100.0									
163 Jaala	169	0.5	1,606	4.6	5,039	14.5	11,511	33.1	7,999	23.0	7,964	22.9	173	0.5	314	0.9	34,776	100.0									
173 Joutseno	315	1.6	1,267	6.3	2,456	12.2	6,293	31.2	6,193	30.7	3,374	16.8	34	0.2	216	1.1	20,147	100.0									
285 Kotka	217	1.2	1,565	8.7	2,731	15.2	5,012	28.0	5,018	28.0	2,906	16.2	148	0.8	334	1.9	17,930	100.0									
286 Kouvola	30	1.4	166	7.9	440	20.7	715	33.7	442	20.9	280	13.2	8	0.4	40	1.9	2,121	100.0									
306 Kuusankoski	61	0.9	334	4.9	1,211	17.7	2,415	35.3	1,616	23.6	1,099	16.1	26	0.4	85	1.2	6,847	100.0									
405 Lappeenranta	638	1.2	4,283	8.0	6,676	12.4	17,491	32.6	15,549	29.0	8,336	15.5	96	0.2	638	1.2	53,707	100.0									
416 Lemi	144	0.9	984	6.2	2,204	13.9	4,719	29.8	4,540	28.7	3,053	19.3	32	0.2	149	0.9	15,824	100.0									
441 Luumäki	471	0.8	3,325	5.7	6,979	11.9	21,655	36.9	16,076	27.4	9,378	16.0	175	0.3	706	1.2	58,765	100.0									
489 Michikkälä	287	0.9	1,918	6.0	4,115	13.0	12,672	39.9	8,074	25.4	4,128	13.0	166	0.5	426	1.3	31,786	100.0									
580 Parikkala	597	1.4	3,303	7.9	8,476	20.2	14,480	34.5	9,369	22.3	5,123	12.2	47	0.1	638	1.5	42,033	100.0									

624	Pyhtää-Pyhtis	204	1.0	1,390	6.8	2,685	13.2	6,451	31.7	5,728	28.2	3,334	16.4	144	0.7	394	1.9	20,329	100.0
689	Rautjärvi	381	1.4	1,826	6.5	4,143	14.8	9,118	32.6	7,803	27.9	4,411	15.8	36	0.1	286	1.0	28,004	100.0
700	Ruokolahti	756	1.0	4,704	6.0	10,026	12.7	28,866	36.6	20,400	25.9	13,166	16.7	113	0.1	756	1.0	78,786	100.0
739	Savitaipale	175	0.4	1,979	4.7	5,482	13.1	14,548	34.8	9,757	23.3	9,532	22.8	49	0.1	296	0.7	41,818	100.0
754	Anjalankoski	461	1.0	2,949	6.1	6,607	13.8	16,460	34.3	12,785	26.6	7,734	16.1	291	0.6	773	1.6	48,060	100.0
775	Suomenniemi	224	0.9	1,633	6.7	3,380	13.9	7,348	30.3	5,463	22.5	6,064	25.0	10	0.0	133	0.6	24,254	100.0
831	Taipalsaari	237	0.9	1,352	4.9	3,375	12.2	8,807	31.9	8,005	29.0	5,489	19.9	65	0.2	291	1.1	27,621	100.0
909	Valkeala	447	0.7	3,325	5.2	9,050	14.3	22,748	35.8	15,156	23.9	11,828	18.6	178	0.3	786	1.2	63,518	100.0
935	Virolahti	383	1.5	2,249	8.5	4,062	15.4	9,716	36.8	5,966	22.6	3,447	13.1	89	0.3	498	1.9	26,409	100.0
978	Ylämaa	303	1.0	1,895	6.2	3,899	12.8	12,432	40.8	7,542	24.8	3,829	12.6	167	0.6	375	1.2	30,442	100.0
Total		7,787	1.0	49,003	6.2	110,008	14.0	268,571	34.2	202,985	25.8	134,493	17.1	2,751	0.4	9,813	1.3	785,412	100.0
<b>Pirkkanmaa</b>																			
<i>Municipality</i>																			
20	Akaa	78	1.4	423	7.7	946	17.2	1,787	32.5	1,508	27.4	650	11.8	23	0.4	83	1.5	5,498	100.0
108	Hämeenkyrö	271	0.9	1,496	4.7	4,574	14.4	11,234	35.4	9,238	29.1	4,280	13.5	265	0.8	418	1.3	31,776	100.0
143	Ikaalinen	799	1.4	3,187	5.7	7,268	13.1	19,471	35.0	15,866	28.5	7,953	14.3	331	0.6	774	1.4	55,650	100.0
177	Juupajoki	252	1.3	1,276	6.3	2,645	13.1	6,117	30.4	6,264	31.1	3,179	15.8	124	0.6	263	1.3	20,120	100.0
211	Kangasala	356	1.0	2,158	6.1	5,482	15.6	11,326	32.2	10,197	29.0	4,954	14.1	218	0.6	474	1.4	35,165	100.0
250	Kilniö	195	0.7	952	3.5	3,053	11.3	11,651	43.2	8,007	29.7	2,802	10.4	86	0.3	205	0.8	26,950	100.0
289	Kuhmalahti	121	0.9	720	5.6	1,561	12.0	4,122	31.8	4,190	32.3	2,066	15.9	65	0.5	126	1.0	12,971	100.0
303	Kuru	501	0.8	2,591	4.4	6,210	10.5	21,843	36.8	18,330	30.9	8,931	15.1	357	0.6	545	0.9	59,309	100.0
310	Kymäkoski	136	1.2	682	5.9	1,584	13.6	3,505	30.1	3,802	32.7	1,724	14.8	61	0.5	143	1.2	11,637	100.0
418	Lempäälä	174	0.9	1,042	5.5	2,657	14.1	6,153	32.6	5,533	29.3	2,882	15.3	182	1.0	279	1.5	18,902	100.0
493	Mouhijärvi	178	1.0	898	5.1	2,767	15.6	6,295	35.4	4,787	26.9	2,395	13.5	164	0.9	301	1.7	17,786	100.0
506	Mänttä	26	0.6	220	4.8	656	14.2	1,509	32.7	1,428	30.9	709	15.4	39	0.9	31	0.7	4,617	100.0
536	Nokia	195	0.9	1,128	5.4	3,322	16.0	6,865	33.1	5,792	27.9	2,754	13.3	298	1.4	373	1.8	20,725	100.0
562	Orivesi	651	1.1	3,914	6.3	8,862	14.3	19,600	31.5	18,159	29.2	9,727	15.6	404	0.7	862	1.4	62,179	100.0
581	Parkano	741	1.2	3,485	5.5	7,988	12.6	24,325	38.5	18,067	28.6	7,447	11.8	387	0.6	737	1.2	63,177	100.0
604	Pirkkala	55	1.0	331	6.1	895	16.4	1,766	32.3	1,528	28.0	743	13.6	62	1.1	86	1.6	5,466	100.0
619	Punkalaidun	288	1.5	842	4.5	1,769	9.4	5,621	29.7	6,228	32.9	3,704	19.6	108	0.6	353	1.9	18,914	100.0
635	Pälkäne	240	0.6	1,753	4.2	5,189	12.4	12,600	30.0	14,915	35.6	6,763	16.1	247	0.6	252	0.6	41,958	100.0

(continued)





681	Rantasalmi	844	1.8	4,207	9.1	8,710	18.9	13,966	30.2	12,884	27.9	5,219	11.3	72	0.2	276	0.6	46,178	100.0
696	Ristina	645	1.3	3,629	7.5	7,636	15.7	14,116	29.1	13,494	27.8	8,316	17.1	166	0.3	543	1.1	48,545	100.0
740	Savonlinna	887	1.3	4,783	6.8	11,450	16.2	23,250	32.9	20,577	29.1	9,028	12.8	121	0.2	545	0.8	70,641	100.0
741	Savonranta	616	1.8	2,947	8.5	4,897	14.1	12,599	36.3	8,211	23.7	5,014	14.5	38	0.1	388	1.1	34,710	100.0
768	Sulkava	824	1.6	4,198	8.3	8,259	16.3	16,063	31.6	14,109	27.8	6,829	13.5	123	0.2	374	0.7	50,778	100.0
	Total	18,189	1.5	100,374	8.3	196,997	16.3	377,039	31.3	325,331	27.0	174,556	14.5	2,406	0.2	11,380	0.9	1,206,273	100.0
<b>Etelä-Pohjanmaa</b>																			
<i>Municipality</i>																			
4	Alahärmä	395	2.1	1,404	7.4	3,852	20.4	7,443	39.5	3,476	18.4	2,130	11.3	4	0.0	165	0.9	18,868	100.0
5	Alajärvi	566	1.1	3,155	6.2	7,048	13.9	20,970	41.2	13,477	26.5	5,203	10.2	116	0.2	312	0.6	50,848	100.0
10	Alavus	627	1.2	2,933	5.5	7,760	14.6	20,301	38.2	14,262	26.8	6,793	12.8	101	0.2	391	0.7	53,169	100.0
52	Evijärvi	346	1.4	1,986	8.0	4,647	18.8	9,092	36.7	5,522	22.3	3,040	12.3	11	0.1	131	0.5	24,776	100.0
74	Halsua	116	0.4	1,347	4.9	6,023	21.8	13,712	49.7	4,564	16.5	1,596	5.8	1	0.0	256	0.9	27,614	100.0
95	Himanka	98	0.6	752	4.5	2,673	16.1	7,143	42.9	3,843	23.1	2,025	12.2	5	0.0	105	0.6	16,645	100.0
145	Ilmajoki	815	2.3	1,901	5.5	4,157	11.9	9,183	26.4	9,871	28.3	8,561	24.6	81	0.2	289	0.8	34,858	100.0
151	Isojoki	323	0.7	1,711	3.7	6,559	14.0	15,898	34.0	13,027	27.9	8,807	18.8	161	0.3	287	0.6	46,773	100.0
152	Isokyrö	401	2.1	1,308	6.9	3,821	20.1	5,838	30.6	3,942	20.7	3,484	18.3	85	0.4	182	1.0	19,061	100.0
164	Jalasjärvi	656	1.3	3,030	6.0	6,334	12.5	19,640	38.9	12,822	25.4	7,532	14.9	107	0.2	408	0.8	50,529	100.0
175	Jurva	372	1.2	1,397	4.5	4,482	14.4	8,385	26.9	9,536	30.5	6,669	21.4	79	0.3	303	1.0	31,221	100.0
217	Kannus	202	0.7	1,547	5.5	5,034	17.8	12,242	43.3	6,512	23.0	2,566	9.1	13	0.1	177	0.6	28,294	100.0
218	Kanjoki	155	1.3	532	4.4	1,674	13.8	3,687	30.5	3,411	28.2	2,456	20.3	66	0.6	118	1.0	12,098	100.0
232	Kauhajoki	1,013	1.2	5,017	6.1	10,632	12.9	37,109	44.9	18,259	22.1	9,655	11.7	173	0.2	787	1.0	82,645	100.0
236	Kauhava	429	1.5	1,901	6.7	4,890	17.2	10,176	35.7	7,405	26.0	3,457	12.1	32	0.1	210	0.7	28,501	100.0
236	Kaustinen	174	0.8	1,262	5.4	4,383	18.9	9,968	43.0	5,388	23.2	1,751	7.6	9	0.0	265	1.1	23,201	100.0
281	Kortesjärvi	349	1.6	1,427	6.4	4,472	20.1	8,228	37.1	5,105	23.0	2,487	11.2	7	0.0	131	0.6	22,206	100.0
300	Kuortane	412	1.3	2,048	6.5	4,463	14.1	10,715	33.9	8,428	26.7	5,205	16.5	33	0.1	282	0.9	31,586	100.0
301	Kurikka	699	2.6	2,289	8.4	3,190	11.7	7,795	28.6	7,209	26.4	5,618	20.6	116	0.4	363	1.3	27,280	100.0
315	Kälviä	290	0.6	2,215	4.9	8,185	18.2	18,821	41.8	10,337	22.9	4,737	10.5	9	0.0	491	1.1	45,085	100.0
399	Laihia	543	1.7	1,572	4.8	5,337	16.4	9,892	30.4	7,878	24.2	6,958	21.4	74	0.2	341	1.1	32,596	100.0
403	Lappajärvi	345	1.2	1,481	5.2	4,186	14.6	11,915	41.4	7,507	26.1	3,111	10.8	40	0.1	185	0.6	28,770	100.0
408	Lapua	535	1.3	2,624	6.1	6,048	14.2	15,768	36.9	10,618	24.8	6,815	15.9	60	0.1	288	0.7	42,756	100.0
414	Lehtimäki	190	1.1	1,101	6.1	2,099	11.6	6,816	37.7	5,343	29.6	2,267	12.6	52	0.3	202	1.1	18,070	100.0

(continued)

Table 5a (continued)

	Open regeneration site		Young seedling stand		Advanced seedling stand		Young thinning stand		Advanced thinning stand		Mature stand		Shelter-wood stand		Seed tree stand		Forest land total	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
421 Lesijärvi	299	0.9	1,745	5.3	5,969	18.0	14,931	45.0	6,878	20.7	3,062	9.2	16	0.1	304	0.9	33,203	100.0
429 Lohtaja	374	1.3	2,102	7.3	5,131	17.8	11,740	40.6	6,388	22.1	2,835	9.8	10	0.0	325	1.1	28,904	100.0
544 Nurmo	425	1.8	1,708	7.4	3,543	15.3	7,984	34.4	5,766	24.9	3,537	15.3	27	0.1	196	0.9	23,187	100.0
584 Perho	103	0.2	3,364	6.4	14,646	27.6	25,826	48.7	7,076	13.4	1,928	3.6	3	0.0	51	0.1	52,997	100.0
743 Seinäjoki	561	1.6	2,180	6.3	5,250	15.1	13,937	40.2	8,444	24.3	4,061	11.7	44	0.1	216	0.6	34,695	100.0
759 Soini	402	1.0	2,072	5.1	6,015	14.8	16,817	41.5	10,317	25.4	4,593	11.3	112	0.3	242	0.6	40,570	100.0
846 Teuva	486	1.4	1,706	4.8	5,058	14.1	10,444	29.1	10,541	29.4	7,087	19.8	211	0.6	346	1.0	35,878	100.0
849 Toholampi	263	0.7	1,737	4.8	5,638	15.6	15,061	41.7	10,019	27.7	3,136	8.7	11	0.0	266	0.7	36,130	100.0
863 Töysä	294	1.4	1,189	5.6	3,065	14.4	7,242	34.0	5,596	26.3	3,673	17.2	26	0.1	228	1.1	21,314	100.0
885 Ullava	70	0.7	455	4.2	1,683	15.7	4,663	43.4	2,784	25.9	983	9.2	1	0.0	101	0.9	10,740	100.0
924 Veteli	312	1.0	1,689	5.2	5,674	17.3	14,466	44.1	7,789	23.8	2,751	8.4	3	0.0	106	0.3	32,791	100.0
934 Vimpeli	235	1.3	966	5.1	3,158	16.7	8,036	42.6	4,489	23.8	1,879	10.0	10	0.1	98	0.5	18,871	100.0
942 Vähäkylä	159	1.8	555	6.2	2,020	22.7	2,346	26.4	1,660	18.7	1,950	21.9	70	0.8	137	1.5	8,897	100.0
971 Ylihärmä	125	1.8	517	7.6	1,174	17.2	2,672	39.2	1,133	16.6	1,124	16.5	6	0.1	71	1.0	6,822	100.0
975 Ylistaro	697	2.5	1,783	6.4	4,615	16.6	8,259	29.7	6,298	22.7	5,796	20.8	106	0.4	251	0.9	27,805	100.0
989 Ähtäri	748	1.2	4,116	6.4	9,343	14.6	24,909	38.9	15,617	24.4	8,588	13.4	155	0.2	520	0.8	63,995	100.0
Total	15,604	1.2	73,824	5.8	203,927	16.0	490,074	38.5	308,536	24.2	169,908	13.3	2,246	0.2	10,128	0.8	1,274,246	100.0
<b>Keski-Suomi</b>																		
<i>Municipality</i>																		
77 Hankaalmi	913	2.0	3,161	6.9	6,848	14.8	13,713	29.7	13,162	28.5	7,552	16.4	78	0.2	707	1.5	46,133	100.0
172 Joutsa	511	1.3	1,742	4.3	7,477	18.4	14,168	34.8	10,542	25.9	5,544	13.6	135	0.3	565	1.4	40,684	100.0
179 Jyväskylä	82	1.2	426	6.0	1,347	19.1	2,302	32.6	1,734	24.6	1,064	15.1	24	0.3	82	1.2	7,060	100.0
180 Jyväskylän mlk	660	1.9	2,226	6.3	5,795	16.3	11,331	31.9	9,297	26.2	5,543	15.6	103	0.3	554	1.6	35,511	100.0
182 Jämsä	1,396	1.5	5,618	5.9	14,644	15.3	29,574	30.9	26,996	28.2	15,443	16.1	698	0.7	1,464	1.5	95,834	100.0
183 Jämsänkoski	492	1.4	2,230	6.6	6,344	18.6	11,221	33.0	8,059	23.7	4,816	14.1	225	0.7	651	1.9	34,037	100.0
216 Kannonkoski	662	1.7	2,527	6.5	6,029	15.4	16,507	42.3	7,842	20.1	4,952	12.7	44	0.1	493	1.3	39,056	100.0

226	Karstula	862	1.2	4,033	5.7	12,557	17.7	33,784	47.7	11,957	16.9	7,199	10.2	36	0.1	375	0.5	70,804	100.0
249	Keuruu	1,347	1.3	8,013	7.5	18,360	17.1	40,723	37.9	23,442	21.8	13,338	12.4	528	0.5	1,697	1.6	107,448	100.0
256	Kinnula	637	1.7	3,046	8.0	7,353	9.4	17,616	46.6	5,727	15.1	3,102	8.2	9	0.0	352	0.9	37,842	100.0
265	Kivijärvi	723	1.8	3,118	7.6	6,792	16.5	18,122	43.9	7,290	17.7	4,837	11.7	32	0.1	352	0.9	41,265	100.0
275	Konnevesi	982	2.3	3,516	8.1	6,750	15.5	13,455	30.8	11,597	26.6	6,671	15.3	68	0.2	618	1.4	43,657	100.0
277	Korpilahti	868	1.7	3,156	6.1	9,394	18.1	16,298	31.4	12,895	24.9	7,983	15.4	266	0.5	1,017	2.0	51,878	100.0
291	Kuhmoinen	719	1.3	3,202	5.6	9,648	17.0	16,457	28.9	15,337	27.0	9,630	16.9	613	1.1	1,296	2.3	56,902	100.0
312	Kyyjärvi	393	1.2	1,801	5.6	6,581	20.6	14,990	46.8	5,106	15.9	2,948	9.2	22	0.1	175	0.5	32,016	100.0
410	Laukaa	1,178	2.4	3,613	7.3	7,445	15.1	15,523	31.5	12,969	26.3	7,616	15.4	101	0.2	865	1.8	49,309	100.0
415	Leivonmäki	660	2.1	1,562	4.9	4,694	14.8	11,018	34.8	8,510	26.9	4,478	14.2	124	0.4	582	1.8	31,627	100.0
435	Luhanka	277	1.5	850	4.7	3,430	9.1	6,219	34.6	4,292	23.9	2,505	13.9	87	0.5	331	1.8	17,989	100.0
495	Multia	1,259	2.0	4,210	6.6	11,119	17.5	26,794	42.1	12,561	19.8	7,043	11.1	93	0.1	489	0.8	63,567	100.0
500	Muurame	192	1.7	787	6.8	2,225	19.2	3,623	31.2	2,779	23.9	1,782	15.3	59	0.5	166	1.4	11,614	100.0
592	Petäjävesi	777	2.0	2,837	7.3	6,944	17.7	13,367	34.2	9,062	23.2	5,427	13.9	143	0.4	565	1.4	39,121	100.0
601	Phtipudas	1,061	1.2	5,119	5.8	14,733	16.7	40,938	46.3	16,342	18.5	9,380	10.6	33	0.0	782	0.9	88,388	100.0
633	Pylkönmäki	612	2.0	2,375	7.9	5,044	16.8	12,901	43.1	5,523	18.4	3,220	10.8	37	0.1	224	0.7	29,935	100.0
729	Saarjärvi	1,337	1.8	5,395	7.3	11,716	15.9	27,556	37.4	16,386	22.3	10,395	14.1	96	0.1	748	1.0	73,629	100.0
850	Toivakka	624	2.1	1,828	6.0	4,942	16.3	9,905	32.6	7,812	25.7	4,522	14.9	103	0.3	629	2.1	30,365	100.0
892	Uratnen	688	2.3	2,066	7.0	4,611	15.6	10,305	34.9	7,167	24.3	4,180	14.1	69	0.2	456	1.5	29,541	100.0
931	Viitasaari	1,812	1.7	8,747	8.2	17,749	16.6	39,360	36.9	22,960	21.5	14,697	13.8	126	0.1	1,352	1.3	106,801	100.0
992	Äänekoski	1,426	2.0	4,702	6.4	10,815	14.8	26,446	36.2	17,987	24.6	10,587	14.5	105	0.1	949	1.3	73,017	100.0
Total		23,150	1.7	91,906	6.6	231,383	16.7	514,216	37.1	315,330	22.8	186,455	13.5	4,057	0.3	18,534	1.3	1,385,031	100.0
<b>Pohjois-Savo</b>																			
<i>Municipality</i>																			
140	Iisalmi	1,351	2.4	3,980	7.1	10,403	18.5	21,243	37.7	11,607	20.6	7,219	12.8	44	0.1	466	0.8	56,313	100.0
174	Juankoski	715	2.0	2,856	7.8	6,143	16.8	12,447	34.1	8,551	23.4	5,290	14.5	59	0.2	492	1.3	36,552	100.0
204	Kaavi	836	1.4	3,117	5.3	8,533	14.6	21,097	36.1	14,883	25.5	8,738	15.0	128	0.2	1,066	1.8	58,399	100.0
227	Kartula	600	1.5	2,704	6.7	6,915	17.2	12,949	32.2	10,534	26.2	5,827	14.5	43	0.1	601	1.5	40,174	100.0
239	Kettle	696	1.7	2,675	6.7	6,231	15.5	15,513	38.7	9,304	23.2	5,173	12.9	25	0.1	512	1.3	40,129	100.0
263	Kiuruvesi	1,242	1.2	5,066	5.1	19,070	19.1	45,961	45.9	19,922	19.9	8,057	8.1	1	0.0	728	0.7	100,047	100.0
297	Kuopio	1,397	1.5	6,191	6.8	15,024	16.4	27,182	29.7	24,766	27.1	15,467	16.9	52	0.1	1,415	1.5	91,494	100.0

(continued)

Table 5a (continued)

	Open regeneration site		Young seedling stand		Advanced seedling stand		Young thinning stand		Advanced thinning stand		Mature stand		Shelter-wood stand		Seed tree stand		Forest land total	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
402 Lapinlahti	850	1.8	2,957	6.3	7,548	16.1	17,911	38.3	10,795	23.1	6,349	13.6	49	0.1	366	0.8	46,826	100.0
420 Leppävirta	1,201	1.3	4,744	4.9	14,250	14.9	27,500	28.7	28,713	29.9	17,702	18.5	30	0.0	1,732	1.8	95,872	100.0
476 Maaninka	547	1.6	2,300	6.6	5,356	15.4	11,454	32.9	9,334	26.8	5,395	15.5	45	0.1	347	1.0	34,778	100.0
534 Nilsia	1,105	2.0	3,642	6.5	9,361	16.7	20,487	36.5	12,864	22.9	8,047	14.3	80	0.1	554	1.0	56,139	100.0
595 Pietavesi	1,577	1.7	5,857	6.2	15,583	16.5	36,783	38.9	22,178	23.4	11,806	12.5	62	0.1	763	0.8	94,608	100.0
686 Rautalamppi	949	2.1	3,367	7.5	7,978	17.7	14,262	31.7	11,178	24.9	6,354	14.1	73	0.2	806	1.8	44,966	100.0
687 Rautavaara	2,092	2.2	4,369	4.6	13,921	14.6	47,444	49.8	18,128	19.0	8,307	8.7	188	0.2	833	0.9	95,281	100.0
749 Siilinjärvi	588	2.1	2,659	9.5	5,189	18.5	8,380	29.9	6,641	23.7	4,188	15.0	29	0.1	306	1.1	27,982	100.0
762 Sonkejärvi	2,872	2.4	6,932	5.7	20,436	16.8	56,891	46.9	22,431	18.5	10,145	8.4	114	0.1	1,567	1.3	121,388	100.0
778 Suonenjoki	1,324	2.2	3,764	6.2	8,846	14.6	17,654	29.2	17,638	29.2	9,846	16.3	68	0.1	1,295	2.1	60,436	100.0
844 Tervo	488	1.7	2,375	8.2	5,054	17.4	9,671	33.3	7,121	24.5	3,983	13.7	41	0.1	305	1.0	29,038	100.0
857 Tuusniemi	736	1.6	3,541	7.7	9,090	19.9	13,401	29.3	10,688	23.4	7,340	16.1	36	0.1	883	1.9	45,716	100.0
915 Varkaus	826	2.6	2,548	8.0	5,010	15.8	9,602	30.2	9,060	28.5	4,378	13.8	71	0.2	273	0.9	31,767	100.0
916 Varpaisjärvi	852	2.2	2,393	6.2	6,530	16.9	14,752	38.2	8,616	22.3	5,099	13.2	41	0.1	310	0.8	38,593	100.0
921 Vesanto	629	1.8	2,876	8.2	5,805	16.6	11,861	34.0	8,314	23.8	4,947	14.2	37	0.1	429	1.2	34,898	100.0
925 Vieremä	1,312	1.8	3,963	5.4	13,907	18.8	33,740	45.7	13,927	18.9	6,071	8.2	22	0.0	849	1.2	73,791	100.0
Total	24,783	1.8	84,877	6.3	226,183	16.7	508,185	37.5	317,194	23.4	175,726	13.0	1,337	0.1	16,899	1.2	1,355,185	100.0
<b>Pohjois-Karjala Municipality</b>																		
45 Eno	1,482	1.8	7,016	8.6	14,864	18.1	29,064	35.5	21,224	25.9	8,026	9.8	3	0.0	295	0.4	81,974	100.0
146 Ilomantsi	641	0.3	16,421	7.4	31,132	14.0	105,001	47.3	46,623	21.0	20,913	9.4	666	0.3	688	0.3	222,086	100.0
167 Joensuu	1,290	1.3	8,555	8.5	15,926	15.8	34,121	33.9	26,037	25.9	13,775	13.7	61	0.1	760	0.8	100,525	100.0
176 Juuka	1,288	1.0	8,478	6.5	17,512	13.5	53,544	41.3	33,729	26.0	14,597	11.3	9	0.0	494	0.4	129,651	100.0
248 Kesälahti	444	1.4	2,905	8.8	4,848	14.8	12,331	37.5	8,391	25.5	3,688	11.2	136	0.4	114	0.4	32,857	100.0
260 Kitee	1,282	1.8	5,958	8.5	11,820	16.8	25,492	36.3	16,119	22.9	9,113	13.0	167	0.2	331	0.5	70,282	100.0
276 Kontiolahti	702	1.1	6,079	9.1	10,050	15.1	23,409	35.1	17,211	25.8	8,800	13.2	84	0.1	356	0.5	66,689	100.0

309	Outokumpu	183	0.5	2,054	5.8	5,018	14.1	11,849	33.3	11,298	31.7	5,170	14.5	0	0.0	43	0.1	35,615	100.0
422	Lieksa	2,417	0.8	20,071	6.9	44,973	15.3	131,646	44.9	56,524	19.3	35,051	12.0	983	0.3	1,436	0.5	293,102	100.0
426	Liperi	701	1.3	4,875	8.7	10,065	17.9	18,273	32.5	16,190	28.8	5,563	9.9	102	0.2	412	0.7	56,182	100.0
541	Nurmes	1,649	1.2	9,885	7.2	23,258	16.8	57,785	41.9	28,028	20.3	16,616	12.0	12	0.0	845	0.6	138,077	100.0
607	Pohvijärvi	653	1.0	4,399	6.9	9,362	14.7	26,259	41.3	17,071	26.8	5,534	8.7	3	0.0	377	0.6	63,658	100.0
632	Pyhäselkä	115	0.5	1,308	6.2	4,374	20.6	7,205	34.0	6,424	30.3	1,715	8.1	3	0.0	57	0.3	21,200	100.0
707	Rääkkylä	636	1.9	2,514	7.3	6,192	18.1	10,351	30.2	10,986	32.1	3,394	9.9	3	0.0	167	0.5	34,242	100.0
848	Tohmajärvi	948	1.4	5,104	7.5	11,048	16.3	24,767	36.4	17,478	25.7	7,986	11.8	20	0.0	623	0.9	67,974	100.0
911	Valtimo	560	0.8	7,069	10.4	11,580	17.0	29,367	43.2	12,979	19.1	6,061	8.9	19	0.0	428	0.6	68,064	100.0
Total		14,992	1.0	112,690	7.6	232,021	15.7	600,464	40.5	346,312	23.4	166,002	11.2	2,271	0.2	7,427	0.5	1,482,179	100.0
<b>Kainuu</b>																			
<i>Municipality</i>																			
105	Hyrnsalmi	879	0.7	7,355	6.2	21,779	18.3	57,151	48.0	14,366	12.1	16,914	14.2	277	0.2	383	0.3	119,104	100.0
205	Kajaani	1,220	0.8	8,788	5.9	23,260	15.7	74,809	50.6	26,692	18.1	12,626	8.5	51	0.0	464	0.3	147,909	100.0
290	Kuhmo	1,794	0.4	24,581	6.1	73,628	18.1	195,189	48.0	50,777	12.5	59,058	14.5	864	0.2	738	0.2	406,629	100.0
578	Paltamo	968	1.2	5,977	7.5	12,477	15.6	36,415	45.6	15,361	19.2	8,223	10.3	97	0.1	355	0.4	79,873	100.0
620	Puolanka	1,785	0.9	15,031	7.5	36,881	18.3	89,992	44.8	27,283	13.6	28,853	14.4	433	0.2	841	0.4	201,099	100.0
697	Ristijärvi	581	0.8	5,241	7.2	12,661	17.4	34,219	47.0	9,330	12.8	10,425	14.3	88	0.1	191	0.3	72,737	100.0
765	Sotkamo	2,110	0.9	13,981	6.1	40,300	17.6	111,091	48.5	35,410	15.5	25,069	11.0	199	0.1	768	0.3	228,929	100.0
777	Suomussalmi	2,195	0.5	25,229	6.0	99,806	23.6	171,688	40.6	47,787	11.3	73,748	17.4	1,419	0.3	1,304	0.3	423,176	100.0
785	Vaala	506	0.6	6,373	7.0	11,535	12.7	44,608	48.9	21,371	23.4	5,906	6.5	0	0.0	896	1.0	91,195	100.0
Total		12,040	0.7	112,557	6.4	332,327	18.8	815,161	46.0	248,377	14.0	240,822	13.6	3,429	0.2	5,939	0.3	1,770,651	100.0
<b>Pohjois-Pohjanmaa</b>																			
<i>Municipality</i>																			
9	Alavieska	342	2.1	1,133	7.1	2,215	13.8	6,269	39.2	4,712	29.4	1,263	7.9	0	0.0	74	0.5	16,007	100.0
69	Haapajärvi	880	1.5	2,355	4.1	7,551	13.1	26,701	46.2	15,708	27.2	4,338	7.5	6	0.0	229	0.4	57,768	100.0
71	Haapavesi	1,431	1.9	3,202	4.3	7,938	10.6	34,120	45.6	22,554	30.1	5,417	7.2	43	0.1	133	0.2	74,839	100.0
72	Haarto	379	2.7	1,252	9.0	2,686	19.3	4,601	33.0	3,510	25.2	1,295	9.3	5	0.0	222	1.6	13,950	100.0
84	Haukipudas	532	1.7	2,315	7.6	4,702	15.4	12,391	40.6	7,317	24.0	2,820	9.3	52	0.2	361	1.2	30,489	100.0
139	Ii	1,138	1.1	6,241	5.8	15,330	14.2	51,164	47.5	24,193	22.4	8,777	8.1	161	0.2	806	0.8	107,809	100.0
208	Kalajohti	1,262	2.7	3,040	6.5	6,745	14.4	19,469	41.5	12,809	27.3	3,108	6.6	41	0.1	452	1.0	46,925	100.0
244	Kempele	81	1.2	405	5.8	1,254	17.8	3,135	44.5	1,704	24.2	401	5.7	16	0.2	53	0.8	7,050	100.0
247	Kestliä	219	0.5	2,254	5.4	4,872	11.7	21,821	52.4	9,574	23.0	2,660	6.4	39	0.1	210	0.5	41,649	100.0

(continued)

Table 5a (continued)

	Open regeneration site		Young seedling stand		Advanced seedling stand		Young thinning stand		Advanced thinning stand		Mature stand		Shelter-wood stand		Seed tree stand		Forest land total	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
255 Kiiminki	251	1.1	1,311	5.6	2,889	12.4	10,847	46.6	5,861	25.2	1,915	8.2	52	0.2	172	0.7	23,298	100.0
305 Kuusamo	4,370	1.2	29,185	8.2	59,097	16.6	132,200	37.2	52,538	14.8	75,430	21.2	1,170	0.3	1,257	0.4	355,247	100.0
317 Kärsämäki	530	1.0	2,004	3.9	6,310	12.2	25,572	49.6	12,985	25.2	4,013	7.8	25	0.1	120	0.2	51,559	100.0
425 Liminka	214	0.6	1,739	4.8	5,960	16.6	19,672	54.7	7,309	20.3	1,020	2.8	16	0.0	66	0.2	35,995	100.0
436 Lumijoki	176	1.4	730	5.6	2,272	17.5	6,317	48.8	2,914	22.5	511	3.9	6	0.1	22	0.2	12,948	100.0
483 Merijärvi	328	1.9	839	4.7	2,018	11.4	6,959	39.3	5,982	33.8	1,518	8.6	3	0.0	50	0.3	17,698	100.0
494 Muhos	741	1.6	3,470	7.2	6,680	13.9	23,430	48.9	10,232	21.4	2,951	6.2	78	0.2	339	0.7	47,923	100.0
535 Nivala	787	2.6	1,999	6.6	3,993	13.2	10,405	34.3	9,904	32.6	3,098	10.2	10	0.0	153	0.5	30,348	100.0
563 Oulainen	1,391	3.1	3,066	6.9	4,923	11.0	16,582	37.1	13,594	30.4	5,009	11.2	8	0.0	176	0.4	44,748	100.0
564 Oulu	229	1.2	951	4.8	2,392	12.1	8,581	43.4	5,595	28.3	1,860	9.4	38	0.2	145	0.7	19,791	100.0
567 Oulunsalo	148	1.4	634	6.0	1,458	13.7	4,803	45.1	2,784	26.1	711	6.7	21	0.2	95	0.9	10,653	100.0
603 Piippola	338	1.0	1,678	4.8	3,522	10.0	18,674	53.3	8,663	24.7	2,079	5.9	2	0.0	115	0.3	35,071	100.0
615 Pudasjärvi	3,428	0.9	24,676	6.7	48,630	13.2	200,969	54.5	49,283	13.4	40,165	10.9	226	0.1	1,547	0.4	368,924	100.0
617 Pulkkila	308	1.1	1,196	4.1	2,665	9.2	14,905	51.5	8,066	27.9	1,713	5.9	8	0.0	55	0.2	28,916	100.0
625 Pyhäjoki	984	2.4	2,684	6.4	6,310	15.1	16,507	39.6	12,219	29.3	2,803	6.7	0	0.0	222	0.5	41,729	100.0
626 Pyhäsalmi	1,331	1.3	4,695	4.5	13,404	12.9	51,165	49.1	27,580	26.5	5,545	5.3	4	0.0	504	0.5	104,227	100.0
630 Pyhäntä	192	0.3	3,091	5.2	5,825	9.8	31,818	53.3	13,830	23.2	4,687	7.9	0	0.0	209	0.4	59,652	100.0
678 Raahе	649	1.7	2,080	5.4	5,330	13.9	15,337	39.9	11,387	29.6	3,574	9.3	0	0.0	94	0.3	38,450	100.0
682 Rantsila	582	1.2	2,327	4.7	5,695	11.4	26,815	53.6	12,194	24.4	2,297	4.6	47	0.1	103	0.2	50,060	100.0
691 Reisjärvi	465	1.4	2,162	6.3	5,312	15.5	18,606	54.3	5,542	16.2	1,938	5.7	-	-	237	0.7	34,263	100.0
746 Stevi	880	1.7	3,837	7.2	7,595	14.3	25,286	47.6	11,567	21.8	3,451	6.5	-	-	541	1.0	53,158	100.0
748 Siikajoki	1,093	1.6	3,677	5.4	9,409	13.8	32,456	47.6	18,257	26.8	3,158	4.6	9	0.0	150	0.2	68,211	100.0
832 Taivalkoski	2,848	1.6	15,452	8.5	23,937	13.1	82,898	45.5	22,456	12.3	33,350	18.3	381	0.2	909	0.5	182,232	100.0
859 Tyrvävä	231	0.9	1,367	5.2	4,077	15.6	13,776	52.7	5,604	21.5	900	3.4	45	0.2	130	0.5	26,129	100.0
889 Utajärvi	887	0.8	5,823	5.4	11,356	10.6	58,661	54.9	22,986	21.5	6,108	5.7	183	0.2	953	0.9	106,956	100.0
926 Vihanti	595	1.8	1,881	5.7	3,801	11.4	14,915	44.9	9,541	28.7	2,437	7.3	1	0.0	60	0.2	33,232	100.0

972	Yli-Ii	436	0.9	3,009	5.9	6,398	12.5	28,217	55.3	9,419	18.4	3,315	6.5	41	0.1	238	0.5	51,073	100.0
973	Ylikiminki	925	1.4	3,505	5.2	6,843	10.2	34,358	51.3	16,531	24.7	4,225	6.3	90	0.1	494	0.7	66,971	100.0
977	Ylivieska	1,080	2.7	3,005	7.4	5,319	13.1	15,709	38.8	11,494	28.4	3,624	9.0	33	0.1	242	0.6	40,505	100.0
	Total	32,680	1.3	154,271	6.3	326,711	13.4	1,146,112	47.0	508,396	20.9	253,484	10.4	2,860	0.1	11,937	0.5	2,436,451	100.0
<b>Lapland</b>																			
<i>Municipality</i>																			
47	Enontekiö	603	0.6	3,793	4.0	6,917	7.3	31,097	33.0	17,557	18.6	33,508	35.5	494	0.5	367	0.4	94,334	100.0
148	Inari	328	0.1	23,117	3.3	94,957	13.3	185,273	26.0	95,934	13.5	282,751	39.7	6,926	1.0	22,829	3.2	712,116	100.0
240	Kemi	132	2.1	487	7.6	1,568	24.5	2,653	41.4	1,271	19.8	284	4.4	2	0.0	11	0.2	6,409	100.0
241	Keminmaa	391	0.9	2,931	6.5	10,508	23.3	19,810	43.9	8,203	18.2	3,157	7.0	56	0.1	65	0.1	45,121	100.0
261	Kittilä	5,346	1.1	23,563	5.1	65,540	14.0	164,264	35.2	107,580	23.0	97,158	20.8	709	0.2	2,835	0.6	466,995	100.0
273	Kolari	1,336	0.8	10,102	5.8	26,314	15.2	74,160	42.7	34,234	19.7	25,196	14.5	185	0.1	2,150	1.2	173,677	100.0
320	Kemijärvi	1,781	0.7	12,310	4.9	36,463	14.5	123,043	48.8	43,766	17.3	30,881	12.2	318	0.1	3,798	1.5	252,360	100.0
498	Muonio	486	0.4	9,810	8.1	11,800	9.7	37,111	30.6	28,780	23.8	31,787	26.2	107	0.1	1,286	1.1	121,167	100.0
583	Pelkosenniemi	939	0.8	5,672	4.7	20,340	16.8	60,035	49.6	17,270	14.3	15,581	12.9	36	0.0	1,132	0.9	121,006	100.0
614	Posto	2,543	1.2	14,140	6.8	26,621	12.8	91,667	44.2	34,579	16.7	35,911	17.3	548	0.3	1,564	0.8	207,573	100.0
683	Ranua	2,019	1.0	13,255	6.6	37,983	18.9	101,717	50.6	24,187	12.0	20,361	10.1	101	0.1	1,512	0.8	201,135	100.0
698	Rovaniemi	4,643	0.8	33,585	6.0	92,899	16.6	276,351	49.4	80,285	14.3	63,452	11.3	720	0.1	7,857	1.4	559,792	100.0
732	Salla	2,064	0.5	20,099	5.3	56,149	14.7	150,583	39.4	58,265	15.3	90,764	23.8	16	0.0	3,978	1.0	381,918	100.0
742	Savukoski	2,761	0.6	28,544	6.5	51,742	11.8	163,890	37.3	68,602	15.6	108,611	24.7	98	0.0	15,705	3.6	439,951	100.0
751	Simo	629	0.7	4,443	5.0	16,922	18.8	40,051	44.6	16,811	18.7	9,802	10.9	561	0.6	630	0.7	89,850	100.0
758	Sodankylä	6,096	0.9	32,870	4.9	83,074	12.4	218,242	32.7	131,699	19.7	185,243	27.7	1,915	0.3	9,007	1.4	668,146	100.0
845	Tervola	621	0.6	6,066	5.5	20,817	19.0	54,622	49.9	15,966	14.6	9,938	9.1	501	0.5	873	0.8	109,404	100.0
851	Tornio	753	0.9	6,101	7.4	17,166	20.8	38,688	46.8	13,179	16.0	6,242	7.6	193	0.2	330	0.4	82,653	100.0
854	Pello	1,157	0.9	8,124	6.0	26,476	19.7	58,478	43.4	22,731	16.9	15,460	11.5	269	0.2	1,949	1.5	134,644	100.0
890	Utsjoki	–	–	87	1.4	117	1.9	5,037	80.0	269	4.3	647	10.3	2	0.0	137	2.2	6,297	100.0
976	Ylitornio	1,095	0.8	8,266	5.9	27,057	19.2	63,926	45.2	22,024	15.6	15,803	11.2	1,074	0.8	2,078	1.5	141,322	100.0
	Total	35,723	0.7	267,365	5.3	731,431	14.6	1,960,699	39.1	843,191	16.8	1,082,538	21.6	14,831	0.3	80,092	1.6	5,015,871	100.0

**Table 5b** The mean volume of growing stock in development classes on forest land (By forestry centres).

Åland Municipality	Open rege- ration site	Young seedling stand	Advanced seedling stand	Young thinning stand	Advanced thinning stand	Mature stand	Shelterwood stand	Seed tree stand	Forest land total
35 Brändö	26.3	0.0	18.8	93.1	93.4	108.7	86.1	–	92.1
43 Eckerö	0.0	12.1	32.8	114.8	194.4	219.1	63.7	36.4	146.2
60 Finström	0.0	13.4	28.3	119.4	195.5	225.6	63.0	30.3	141.9
62 Föglö	0.0	24.2	39.7	114.0	176.4	174.5	61.3	5.9	136.0
65 Geta	0.0	12.6	30.5	108.0	180.3	218.1	62.9	39.7	139.4
76 Hammarland	0.0	12.8	32.4	120.0	194.7	215.3	65.1	31.5	144.5
170 Jomala	0.0	13.8	31.6	118.7	202.1	227.8	65.3	21.0	147.7
295 Kumlinge	33.2	35.0	43.4	116.5	135.7	140.9	70.3	16.4	115.6
318 Kökar	–	83.7	9.7	89.1	130.8	131.9	71.7	11.0	93.0
417 Lemland	0.0	18.6	33.7	119.8	199.3	222.0	57.7	24.9	143.9
438 Lumparland	0.0	13.4	34.4	106.7	191.1	203.7	60.6	17.8	145.1
478 Mariehamn	0.0	10.5	26.9	107.9	181.1	196.8	64.6	30.7	115.1
736 Saltvik	0.4	14.2	34.0	112.3	193.0	211.1	65.9	25.0	151.2
766 Sottunga	26.6	29.2	19.5	106.1	142.3	149.0	54.1	8.7	102.9
771 Sund	0.1	13.0	35.4	114.0	193.7	207.4	64.7	20.2	144.2
941 Vårdö	5.9	14.3	32.0	104.6	178.7	192.9	58.6	18.2	137.4
Total	5.3	18.0	32.3	114.6	182.3	198.0	63.4	24.8	138.5
<b>Rannikko/Etelärannikko</b>									
<i>Municipality</i>									
40 Dragsfjärd	0.0	9.4	24.3	107.9	169.2	196.5	79.1	14.8	142.8
49 Espoo-Esbo	0.0	18.9	54.7	101.4	212.1	237.8	151.1	51.0	165.0
78 Hanko-Hangö	0.0	7.9	27.1	127.0	150.4	232.9	86.6	60.0	138.3
91 Helsinki-Helsingfors	0.8	28.8	58.9	102.8	201.7	235.3	171.2	47.2	137.2
92 Vantaa-Vanda	0.0	24.6	48.7	115.2	226.6	241.4	141.0	70.7	157.4
101 Houtskär-Houtskari	–	40.5	36.6	98.8	116.3	191.0	52.0	89.3	126.5



149	Ingå-Inkoo	0.0	33.5	38.8	107.5	233.4	233.8	96.7	43.7	169.8
150	Iniö	-	46.6	39.5	88.0	161.4	184.8	43.2	81.9	140.9
220	Karis-Karjaa	0.0	22.2	30.6	115.0	225.5	227.9	85.6	50.4	151.7
235	Kauniainen-Grankulla	-	24.0	44.5	102.3	197.6	235.9	187.6	52.3	157.2
243	Kimito-Kemiö	0.0	9.6	22.2	112.4	169.4	198.7	72.8	21.5	139.7
257	Kirkkonummi-Kyrkslätt	1.3	24.7	45.8	98.4	217.2	247.0	124.5	42.1	161.1
279	Korpo-Korppoo	0.0	29.0	38.8	98.0	132.6	183.9	26.9	85.6	120.7
407	Lapinjärvi-Lappträsk	2.6	14.6	46.4	115.5	194.6	239.4	144.2	38.7	154.8
424	Liljendal	1.7	10.3	42.6	114.6	187.6	240.4	95.5	36.7	150.4
434	Lovitsa-Lovisa	9.6	0.0	37.5	123.5	202.6	223.8	151.0	21.1	156.4
533	Nagu-Nauvo	0.0	26.8	24.1	94.3	145.1	202.3	73.1	60.6	131.0
573	Pargas-Parainen	0.0	8.8	31.7	99.4	147.4	196.0	70.9	26.8	126.6
585	Pernä-Pernaja	3.6	16.5	39.4	122.5	195.1	231.4	140.1	26.4	146.9
606	Pohja-Pojo	0.0	14.2	29.0	113.8	166.2	234.8	83.0	31.3	133.8
638	Porvoo-Borgå	3.4	33.6	51.5	130.1	214.4	234.7	123.2	25.1	155.6
701	Ruotsinpyhtää-Strömfors	4.2	4.6	38.0	114.4	207.8	237.3	151.0	18.1	145.6
753	Sipoo-Sibbo	3.9	45.3	52.5	129.6	222.9	259.6	104.5	57.1	166.5
755	Siuntio-Sjundeå	1.2	19.3	45.3	97.7	247.0	258.1	116.0	56.7	174.5
835	Ekenäs-Tammisaari	0.0	6.9	32.5	114.9	168.4	220.8	86.2	47.1	137.4
923	Västamfjärd	0.0	7.9	24.5	115.8	164.8	207.3	74.0	12.1	138.7
Total		1.8	20.9	39.8	114.6	190.5	224.6	99.4	46.3	148.2
<b>Rannikko/Pohjanmaa</b>										
<i>Municipality</i>										
231	Kaskinen-Kaskö	0.0	10.4	26.1	86.0	152.5	188.1	-	3.7	108.7
272	Kokkola-Karleby	3.3	5.4	25.7	88.6	163.2	196.9	97.8	13.3	103.1
280	Korsnäs	0.7	5.8	23.9	87.7	156.3	177.5	105.7	25.3	104.1
287	Kristinestad-Kristinankaupunki	0.7	8.9	29.4	89.3	156.6	181.1	125.8	21.8	117.2
288	Kronoby-Krunuppy	2.1	5.0	24.0	84.9	162.2	191.6	69.5	11.2	102.1
440	Larsmo-Luoto	3.1	7.7	20.8	85.2	163.0	191.7	96.3	12.0	92.6

(continued)

Table 5b (continued)

	Open regene- ration site	Young seedling stand	Advanced seedling stand	Young thinning stand	Advanced thinning stand	Mature stand	Shelterwood stand	Seed tree stand	Forest land total	
		(m <sup>2</sup> /ha)								
475	Malax-Maalaihti	0.4	5.7	25.6	80.7	151.8	192.4	131.5	24.5	97.2
499	Korsholm-Mustasaari	0.0	13.1	22.7	69.0	164.9	196.1	148.8	37.8	106.4
545	Närpes-Närpiö	0.3	6.0	28.9	82.1	160.0	188.5	148.1	28.3	113.5
559	Oravais-Oravainen	1.1	11.3	26.1	89.6	141.8	179.9	75.2	17.0	98.2
598	Jakobstad-Pietarsaari	0.8	8.4	29.2	92.0	137.0	181.0	76.4	10.4	95.0
599	Pedersöre-Pedersören kunta	2.1	7.5	22.8	85.7	147.2	189.2	68.3	16.1	97.2
893	Nykarleby- Uusikaarlepyy	1.0	9.4	26.2	87.4	129.3	168.7	67.4	15.9	90.4
905	Vaasa-Vasa	0.1	7.3	25.9	75.9	167.3	202.8	149.4	41.7	118.7
945	Vörå-Maxmo-Vöyri- Maksamaa	0.4	9.1	27.9	91.6	164.5	181.0	115.7	28.3	110.7
Total	1.1	8.0	25.6	84.1	155.7	186.7	98.9	21.7	104.3	
<b>Lounais-Suomi</b>										
<i>Municipality</i>										
6	Alastaro	17.5	23.4	41.0	121.2	191.4	231.9	102.2	33.4	148.0
17	Askainen	0.0	12.8	33.7	120.9	177.1	195.9	84.0	31.0	144.4
19	Aura	9.8	40.3	38.6	108.8	198.1	228.3	125.1	29.3	150.2
50	Eura	11.6	31.3	39.4	115.2	194.0	229.8	122.3	38.1	143.6
51	Eurajoki	6.3	32.3	40.5	117.5	211.2	237.3	115.1	37.8	148.0
73	Halikko	0.0	14.5	35.5	117.7	195.7	224.9	118.7	31.7	152.6
79	Harjavalta	15.7	25.4	40.2	119.9	186.3	233.3	100.9	31.7	138.4
99	Honkajoki	6.6	17.2	18.4	77.4	150.2	155.3	51.6	36.6	92.9
102	Huitinen	17.5	26.0	40.4	122.1	205.3	257.7	102.7	42.1	153.3
181	Jämijärvi	13.2	12.5	26.4	109.7	180.9	209.6	87.4	30.3	121.7
202	Kaarina	0.0	13.0	32.6	118.4	185.4	193.2	111.9	29.0	133.7
214	Kankaanpää	9.5	17.9	23.4	94.4	170.3	198.6	107.5	38.2	112.1
230	Karvia	4.7	18.1	16.9	76.7	147.2	172.3	62.7	34.1	93.2

252	Kiikala	8.0	30.6	37.3	111.4	196.6	230.3	115.7	30.9	155.5
254	Kiikoinen	12.0	13.4	28.4	118.1	199.3	241.9	107.4	28.8	136.9
259	Kisko	7.2	31.1	35.8	111.7	202.1	223.3	97.6	30.5	153.5
262	Kiukainen	8.2	26.4	39.1	121.0	206.4	243.5	121.6	38.3	147.1
271	Kokemäki	11.7	28.8	35.2	119.1	191.4	241.7	101.4	31.6	140.6
284	Koski Tl	20.1	20.8	43.7	121.3	218.2	255.9	105.2	34.9	165.2
304	Kustavi	0.0	27.9	29.9	104.3	160.8	196.8	75.0	62.1	142.9
308	Kuusjoki	16.7	31.1	42.9	116.6	199.2	245.0	121.5	35.4	164.7
319	Köyliö	8.8	30.0	40.4	111.5	187.9	221.5	119.3	38.0	140.6
400	Laitila	7.4	40.7	38.4	111.5	196.1	222.9	119.0	36.7	144.5
406	Lappi	10.0	34.1	39.5	110.6	191.8	222.5	122.3	36.9	141.3
413	Lavia	13.9	14.6	30.9	115.5	197.2	218.0	102.4	32.9	131.9
419	Lemu	0.1	17.8	31.9	108.9	175.0	204.3	97.4	24.4	126.2
423	Lieto	5.2	35.7	38.9	107.9	194.9	218.7	127.4	29.2	150.8
430	Loimaa	18.2	20.8	41.2	121.3	218.7	252.0	121.7	40.2	165.5
442	Luvia	10.4	33.9	43.6	114.5	237.2	269.3	112.9	78.7	168.5
480	Marttila	19.8	34.3	43.5	113.4	190.7	239.3	115.5	35.2	151.6
481	Masku	0.1	24.6	33.7	109.5	173.6	208.2	95.9	25.6	134.4
482	Mellilä	20.6	20.6	44.4	117.3	209.3	243.6	111.3	40.4	152.2
484	Merikarvia	13.5	20.2	30.0	115.5	197.6	213.3	115.2	34.3	125.1
485	Merimasku	0.0	20.5	36.1	124.4	166.3	195.5	71.9	59.9	150.7
501	Muurila	4.1	32.2	35.3	112.4	205.0	219.5	127.7	31.8	154.9
503	Mynämäki	10.1	33.6	36.8	109.6	184.0	217.9	118.9	38.4	135.2
529	Naantali	0.0	14.7	33.1	119.8	174.2	190.9	92.9	35.5	142.1
531	Nakkila	7.7	24.2	34.4	122.7	217.5	262.6	126.3	55.0	150.2
537	Noormarkku	12.1	19.5	33.9	116.8	197.9	239.1	118.1	30.5	142.6
538	Nousiainen	18.0	30.1	37.9	116.4	191.2	225.9	122.4	38.1	151.0
561	Oripää	9.6	32.6	37.6	109.4	174.2	218.1	120.3	29.3	140.2
577	Paimio	0.0	16.0	32.9	121.9	186.4	209.3	116.7	31.4	146.4
586	Perniö	3.2	35.3	36.5	109.2	205.2	214.2	121.4	29.8	157.9
587	Pertteli	9.2	32.7	37.6	112.0	201.0	224.6	128.1	25.3	154.5
602	Ptikkiö	0.0	14.6	32.3	123.2	188.9	198.6	110.8	30.1	143.1

(continued)

Table 5b (continued)

	Open regene- ration site	Young seedling stand	Advanced seedling stand	Young thinning stand	Advanced thinning stand	Mature stand	Shelterwood stand	Seed tree stand	Forest land total
		(m <sup>2</sup> /ha)							
608	Pomarkku	19.4	32.5	114.6	201.2	239.9	132.7	40.7	154.5
609	Pori	22.4	35.6	115.5	216.5	254.0	101.8	56.1	144.0
631	Pyhäranta	43.0	40.9	116.1	199.6	218.0	104.1	43.8	152.2
636	Pöytyä	39.4	38.3	111.0	189.9	230.5	126.3	32.1	149.4
680	Raisio	14.6	33.5	112.0	184.2	196.8	101.8	29.9	133.4
684	Rauma	38.8	41.8	114.6	195.8	215.1	111.2	42.1	144.7
704	Rusko	27.2	34.9	106.5	175.8	167.7	73.9	26.5	136.4
705	Rymättylä	26.0	33.5	105.8	162.4	183.0	89.0	56.0	141.5
734	Salo	31.0	37.3	113.4	202.6	209.9	120.3	28.6	147.8
738	Sauvo	20.0	34.3	117.6	180.9	206.2	97.0	27.8	135.0
747	Siikainen	21.0	27.4	105.4	189.7	203.4	131.8	34.6	121.7
761	Somero	24.0	41.9	123.0	211.5	249.4	109.7	35.6	161.8
776	Suomusjärvi	20.8	35.5	112.7	200.4	234.4	103.0	29.9	150.3
783	Säkylä	29.3	40.7	111.6	183.0	213.8	116.3	35.8	141.3
784	Särkisalo-Finby	19.9	40.6	119.0	197.1	226.2	105.6	26.6	155.3
833	Taivassalo	17.4	30.0	116.6	166.7	182.7	84.5	39.7	140.8
838	Tarvasjoki	42.0	38.5	111.8	201.0	227.7	122.7	29.7	152.9
853	Turku-Abo	16.8	33.3	109.3	178.3	200.1	104.3	30.1	131.5
886	Ulvila	18.6	35.5	115.6	199.4	232.6	103.1	38.7	138.1
895	Uusikaupunki	23.8	33.8	112.9	178.6	196.0	97.1	30.6	128.4
906	Vahto	30.6	38.1	116.3	190.1	223.0	124.2	43.8	148.9
913	Vampula	25.1	40.5	125.1	198.8	246.5	95.5	38.2	158.3
918	Vehmaa	20.2	34.6	116.9	178.3	193.6	98.6	25.5	127.5
920	Velkua	31.1	30.9	77.3	152.9	185.3	61.7	70.3	137.1
979	Yläne	34.7	40.0	108.8	186.0	213.6	124.6	47.7	140.8
Total		25.6	34.4	110.3	191.9	222.7	109.1	37.0	139.8

<b>Häme-Uusimaa</b>												(continued)
<i>Municipality</i>												
15	Arjärvi	19.2	38.1	36.1	106.9	200.0	242.5	111.1	57.2	146.9		
16	Asikkala	4.4	20.0	41.8	125.9	211.2	260.1	142.4	15.8	157.6		
18	Askola	7.6	32.3	38.5	121.2	209.0	260.9	126.1	47.9	166.1		
61	Forssa	8.0	25.0	40.8	106.1	204.0	275.9	139.6	60.7	155.8		
81	Hartola	0.0	25.7	41.7	131.9	215.2	247.5	125.5	13.0	155.9		
82	Hattula	13.7	14.4	36.9	114.6	211.6	254.3	70.6	42.3	145.6		
83	Hauho	10.2	13.4	40.4	116.7	240.5	263.7	142.8	14.9	176.8		
86	Hausjärvi	10.0	22.1	37.6	127.0	224.6	259.2	135.9	33.6	158.6		
98	Hollola	10.6	29.1	38.0	113.5	222.8	258.9	129.6	38.9	149.5		
103	Humppila	7.1	37.6	49.9	91.2	221.4	270.0	111.8	0.0	167.3		
106	Hyvinkää	7.6	18.0	34.0	118.7	215.7	264.0	107.8	61.4	156.5		
109	Hämeenlinna	4.1	8.2	38.0	120.3	222.7	264.0	56.7	34.9	153.2		
111	Heinola	23.8	21.0	43.6	114.4	205.6	231.5	124.9	15.5	143.7		
165	Janakkala	0.9	12.5	37.4	124.9	219.3	275.7	125.1	35.6	162.0		
169	Jokioinen	14.4	36.9	40.2	105.8	216.2	273.2	146.6	60.8	167.1		
186	Järvenpää	6.3	16.9	35.6	129.0	235.8	245.4	140.1	65.6	139.8		
210	Kalvola	9.3	15.7	42.9	117.3	213.0	254.8	80.5	41.5	147.3		
223	Karjalohja	2.1	18.0	25.4	106.5	206.6	234.4	–	47.8	137.3		
224	Karkkila	2.9	8.9	29.3	115.4	218.5	258.1	52.2	62.5	162.6		
245	Kerava	10.3	21.5	35.0	133.2	234.7	273.6	106.5	82.1	151.2		
283	Hämeenkoski	3.4	20.4	41.2	120.7	223.6	262.1	149.2	5.4	154.7		
316	Kärkölä	9.3	25.7	38.1	117.8	232.1	264.7	136.1	43.3	159.2		
398	Lahti	22.1	31.9	41.0	106.2	209.9	249.0	96.8	24.0	134.6		
401	Lammi	0.7	15.4	44.3	119.5	211.0	253.3	181.5	0.9	152.0		
433	Loppi	3.3	8.7	35.8	113.4	214.1	267.6	70.6	54.5	158.6		
444	Lohja-Lojo	0.4	8.5	25.4	97.6	231.4	240.7	48.0	64.3	154.7		
504	Myrskylä-Mörskom	5.9	35.0	40.9	113.1	202.5	252.3	126.1	48.1	156.8		
505	Mäntsälä	11.4	25.5	39.9	124.6	234.6	266.4	128.5	44.0	171.4		
532	Nastola	18.8	23.4	38.5	101.5	201.6	238.6	108.4	20.7	136.4		
540	Nummi-Pusula	3.4	16.2	21.8	109.9	215.9	239.8	36.7	67.4	146.4		

Table 5b (continued)

	Open regene- ration site	Young seedling stand	Advanced seedling stand	Young thinning stand	Advanced thinning stand	Mature stand	Shelterwood stand	Seed tree stand	Forest land total	
		(m <sup>2</sup> /ha)								
543	Nurmijärvi	5.2	13.2	31.8	122.1	228.6	250.9	81.7	67.2	157.7
560	Orimattila	13.7	33.4	32.6	106.6	206.5	248.9	108.8	53.4	139.8
576	Padasjoki	0.0	17.1	49.2	122.4	210.5	257.9	150.5	8.0	163.5
611	Pornainen	6.6	24.8	36.3	128.0	221.9	261.3	97.2	43.2	155.9
616	Pukila	6.0	30.1	37.9	115.2	215.3	265.3	120.7	50.0	149.0
692	Renko	0.0	7.4	38.8	108.1	221.6	257.2	72.9	37.6	160.5
694	Riihimäki	0.4	13.4	32.7	123.4	223.5	290.4	103.5	54.7	160.6
737	Sammatti	1.9	14.5	24.9	106.8	207.2	233.8	0.0	42.8	135.3
781	Sysmä	0.0	27.6	45.4	136.2	211.8	246.2	138.4	24.6	161.6
834	Tammela	4.7	22.0	36.0	104.4	202.4	256.2	115.7	61.4	150.9
855	Tuulos	1.1	10.7	37.8	118.6	217.1	252.5	200.3	0.0	151.7
858	Tuusula	8.6	16.3	33.3	127.9	239.6	263.8	97.6	86.8	160.7
927	Vihhti	0.0	11.0	28.7	114.0	222.9	240.0	52.9	77.2	164.7
981	Ypäjä	20.5	38.5	38.1	100.0	213.0	295.4	123.5	0.0	172.1
Total		6.5	20.0	38.5	117.1	215.8	254.5	117.2	46.3	155.4
<b>Kaakkois-Suomi</b>										
<i>Municipality</i>										
44	Elimäki	4.2	16.7	33.1	116.4	205.1	259.5	142.1	18.6	149.0
75	Hamina	3.9	13.4	31.5	110.8	196.2	249.2	127.1	19.8	136.2
142	Iitti	6.8	17.1	35.3	111.3	198.9	248.7	118.6	20.1	138.1
153	Imatra	13.3	6.8	25.2	125.1	223.8	260.9	115.4	24.9	149.8
163	Jaala	7.5	17.5	36.2	116.6	210.5	247.3	111.8	18.7	150.5
173	Joutseno	12.3	9.1	26.3	123.2	222.5	259.6	114.6	31.3	154.9
285	Kotka	2.5	15.8	33.4	112.3	204.9	238.5	125.8	16.8	135.2
286	Kouvola	6.7	12.3	29.6	113.4	195.2	244.9	116.5	13.4	119.2
306	Kuusankoski	6.9	14.3	34.0	111.9	204.2	251.8	112.9	15.4	135.5

405	Lappeenranta	6.0	6.9	26.7	114.6	215.0	275.6	98.3	26.5	146.8
416	Lemi	8.7	10.9	28.1	119.9	220.4	268.1	97.0	25.5	155.8
441	Luumäki	3.6	10.2	31.7	107.0	200.0	269.9	113.9	20.9	142.2
489	Miehikkälä	7.0	6.6	26.8	104.2	201.6	256.7	126.6	29.2	131.1
580	Parikkala	11.5	7.7	37.1	113.1	196.7	257.2	101.8	36.3	123.1
624	Pyhtää-Pyttis	1.9	23.3	34.6	117.7	208.5	235.8	138.6	17.7	142.3
689	Rautjärvi	20.2	8.4	30.2	119.0	209.6	263.5	107.2	35.2	144.4
700	Ruokolahdi	14.9	9.4	31.3	114.8	198.9	260.8	112.5	26.8	142.2
739	Savitaipale	9.6	13.4	29.9	120.5	198.8	252.1	91.6	19.7	150.6
754	Anjalankoski	2.8	15.1	32.9	108.9	194.0	250.0	134.9	17.7	135.7
775	Suomenniemi	19.7	13.6	24.1	116.6	184.2	226.2	82.0	28.1	138.0
831	Taipalsaari	11.2	11.0	32.2	118.0	201.7	242.9	111.0	28.8	149.5
909	Valkeala	5.2	14.4	33.8	111.7	200.9	253.5	112.3	17.3	141.3
935	Virolahti	4.8	5.3	25.9	102.8	202.1	251.1	123.5	24.5	121.6
978	Ylämaa	5.5	4.8	26.4	105.3	211.0	261.1	119.9	32.8	132.9
Total		8.3	11.3	31.4	112.8	203.2	254.6	121.0	23.6	140.6
<b>Pirkanmaa</b>										
<i>Municipality</i>										
20	Akaa	16.5	18.1	27.9	120.8	204.4	245.8	108.7	33.4	131.8
108	Hämeenkyrö	12.2	23.1	27.9	113.0	209.3	255.7	136.1	38.6	142.1
143	Ikaalinen	9.1	16.5	27.4	102.4	183.5	230.5	114.0	34.9	126.9
177	Juupajoki	8.1	19.5	27.8	112.5	205.2	252.0	108.1	36.4	144.0
211	Kangasala	11.1	21.6	32.0	119.9	209.1	250.9	116.9	38.5	142.3
250	Kihniö	6.3	11.6	29.4	91.8	151.6	190.3	74.9	31.6	108.8
289	Kuhmalahti	9.5	19.3	37.4	122.7	213.4	244.1	105.8	37.7	153.3
303	Kuru	7.7	16.5	30.1	104.1	179.8	224.1	118.7	43.1	132.7
310	Kylmäkoski	12.1	22.3	31.5	117.8	206.8	248.4	97.7	40.2	146.6
418	Lempäälä	12.5	24.6	30.4	120.7	220.1	264.3	145.0	39.4	151.7
493	Mouhijärvi	12.7	22.9	27.2	111.6	199.2	250.1	129.8	43.8	134.3
506	Mänttä	8.4	18.9	31.6	118.7	216.8	265.0	133.4	34.5	153.3
536	Nokia	12.6	28.9	27.2	114.1	211.6	256.2	125.3	45.5	139.6

(continued)

Table 5b (continued)

	Open regene- ration site	Young seedling stand	Advanced seedling stand	Young thinning stand	Advanced thinning stand	Mature stand	Shelterwood stand	Seed tree stand	Forest land total	
		(m <sup>2</sup> /ha)								
562	Orivesi	8.9	21.2	29.7	116.1	204.8	253.8	121.9	39.8	143.1
581	Parkano	5.3	12.3	27.2	90.4	154.7	197.1	89.9	34.4	107.4
604	Pirkkala	16.6	24.4	25.3	118.7	223.8	266.3	131.2	37.3	144.9
619	Punkalaidun	21.0	24.0	43.6	116.0	224.2	253.7	111.7	42.3	164.9
635	Päikäne	11.0	18.1	39.3	127.0	226.5	248.2	117.6	35.4	165.2
702	Ruovesi	8.2	17.1	29.6	112.4	202.5	250.0	116.9	38.8	149.6
837	Tampere	10.9	21.3	28.5	115.8	215.7	254.6	133.6	38.2	149.7
887	Urjala	10.8	20.2	32.4	114.4	211.4	253.3	111.2	38.4	149.9
908	Valkeakoski	15.5	19.7	31.7	123.9	216.9	256.4	104.1	35.3	148.1
912	Vammala	11.5	21.2	27.5	110.0	196.2	252.0	123.2	43.0	135.3
922	Vesilahti	10.8	22.8	27.1	116.2	215.2	265.6	123.7	42.6	155.3
933	Vilppula	7.6	15.8	31.2	114.7	208.4	258.5	121.6	39.1	150.1
936	Virrat	7.2	11.6	27.0	98.6	169.2	218.2	100.6	34.3	117.0
980	Ylöjärvi	10.2	21.4	28.2	111.4	210.3	254.9	126.9	38.2	142.7
988	Äetsä	10.4	18.6	26.0	110.5	187.7	249.5	112.4	41.9	127.0
Total	9.8	18.4	29.5	109.2	196.9	242.8	117.4	38.7	137.7	
<b>Etelä-Savo</b>										
<i>Municipality</i>										
46	Enonkoski	10.0	9.1	27.6	120.2	205.6	263.5	66.3	26.3	136.6
90	Hänävesi	12.1	7.8	25.1	111.7	211.0	239.9	87.8	12.4	125.8
97	Hirvensalmi	8.0	13.1	35.7	122.9	204.6	259.5	80.5	39.4	141.3
171	Joroinen	4.8	15.7	28.3	109.4	214.6	278.2	86.3	19.8	135.7
178	Juva	4.2	12.9	30.4	111.9	205.9	268.4	89.5	27.3	139.2
213	Kangasniemi	4.6	13.9	28.8	107.2	198.3	274.8	94.2	29.6	134.9
246	Kerimäki	25.8	8.2	31.7	117.0	200.4	255.8	145.5	26.3	132.3
491	Mikkeli	3.7	9.9	29.4	113.0	201.1	266.9	95.3	35.7	137.6



507	Mäntyharju	4.7	12.4	26.3	118.8	191.4	261.6	111.7	26.6	128.5
588	Pertunmaa	4.9	13.0	31.7	108.5	214.8	240.9	97.6	34.3	132.4
593	Pieksämäki	4.7	15.1	26.7	104.5	208.6	269.1	63.3	20.1	128.4
618	Punkaharju	18.2	7.1	31.2	114.2	201.4	289.2	93.0	27.6	144.2
623	Puumala	28.2	10.2	33.0	116.3	175.4	235.0	171.1	21.3	133.7
681	Rantasalmi	8.1	11.8	34.0	107.7	215.4	261.7	91.5	28.4	130.2
696	Ristina	4.8	9.9	33.2	116.6	197.4	249.7	103.9	29.9	138.3
740	Savonlinna	23.7	6.4	32.1	121.3	192.8	250.8	132.8	27.3	134.5
741	Savonranta	7.4	11.9	28.4	104.1	202.4	272.3	80.0	19.7	130.4
768	Sulkava	19.1	9.2	29.3	116.1	196.1	259.5	115.4	26.4	132.4
Total		9.5	11.3	29.6	112.7	201.4	261.4	101.9	26.5	133.8
<b>Etelä-Pohjanmaa</b>										
<i>Municipality</i>										
4	Alahärmä	1.7	2.8	15.7	84.6	145.9	183.1	77.0	15.5	84.5
5	Alajärvi	3.0	4.2	18.6	77.4	149.5	176.3	92.0	32.3	92.9
10	Alavus	2.4	4.1	22.1	79.9	153.9	179.4	91.0	22.3	98.5
52	Evijärvi	1.9	3.5	19.7	79.5	160.5	195.5	70.4	10.1	93.0
74	Halsua	0.8	8.3	23.9	71.2	141.6	149.4	92.2	14.4	73.2
95	Himanka	2.1	6.0	20.8	89.4	163.3	179.6	94.2	9.0	101.6
145	Ilmajoki	0.7	4.6	18.5	78.8	146.4	168.8	129.7	19.0	106.6
151	Isojoki	1.6	8.3	24.6	74.5	149.7	173.9	96.4	19.3	104.0
152	Isokyrö	0.4	5.9	26.6	86.9	142.5	175.7	124.4	20.5	94.7
164	Jalasjärvi	2.2	6.6	17.8	79.4	148.9	184.2	58.0	19.0	99.0
175	Jurva	0.5	3.2	24.2	73.9	149.8	175.5	126.5	25.4	107.3
217	Kannus	1.2	5.9	20.0	85.8	158.3	169.7	92.9	10.4	93.0
218	Karjoki	0.8	8.5	20.0	73.8	140.9	184.6	88.8	24.8	103.6
232	Kauhajoki	1.1	5.1	15.5	65.3	139.4	161.4	81.0	21.9	81.6
233	Kauhava	1.0	3.6	16.5	80.5	151.9	187.7	83.6	13.6	94.2
236	Kaustinen	0.7	7.1	19.5	72.9	147.6	170.3	92.1	8.5	82.7
281	Kortesjärvi	1.0	3.8	16.2	79.9	146.3	194.6	82.4	10.6	88.6

(continued)

Table 5b (continued)

	Open regene- ration site	Young seedling stand	Advanced seedling stand	Young thinning stand	Advanced thinning stand	Mature stand	Shelterwood stand	Seed tree stand	Forest land total
					(m <sup>3</sup> /ha)				
300	0.6	3.7	18.0	78.8	156.1	196.6	87.5	19.5	103.8
301	1.3	7.8	15.9	74.5	145.1	178.8	82.3	26.4	99.7
315	1.5	7.1	25.9	74.4	155.1	170.0	81.2	13.9	89.7
399	0.3	4.1	25.8	81.9	149.7	187.8	145.5	22.5	106.1
403	1.6	4.8	19.0	81.0	152.9	182.9	92.0	22.5	96.5
408	1.8	6.8	20.4	80.6	156.4	180.2	62.2	18.1	100.8
414	2.7	4.3	18.7	72.9	139.9	181.8	92.0	33.9	94.8
421	1.6	8.4	20.6	74.1	150.9	165.9	83.7	15.4	84.2
429	0.8	4.8	21.7	78.8	156.2	165.5	94.8	8.3	87.1
544	1.6	7.7	19.2	70.9	148.6	170.9	59.7	25.6	91.3
584	10.5	2.3	19.4	73.9	145.0	167.5	72.9	15.5	67.0
743	3.2	6.1	19.5	79.3	144.1	173.7	85.8	17.3	90.9
759	5.1	5.1	20.2	80.0	159.3	187.9	89.9	22.8	98.6
846	1.0	6.7	18.4	71.1	142.9	175.0	96.3	22.9	101.0
849	0.6	10.7	27.7	75.5	153.5	173.7	92.3	17.5	94.1
863	0.4	4.0	21.2	83.1	154.3	197.3	43.3	12.7	106.2
885	0.4	11.5	23.9	77.4	144.5	178.6	92.3	14.5	91.8
924	6.0	6.9	19.4	80.0	159.5	199.0	91.6	13.5	93.7
934	6.2	5.2	19.7	82.2	153.2	182.8	92.0	15.4	92.6
942	0.1	8.7	23.2	80.4	158.9	186.0	149.0	38.0	99.7
971	3.2	4.1	18.5	87.8	153.5	169.4	40.7	23.4	91.6
975	1.0	6.8	20.4	84.9	143.5	166.0	95.7	20.6	96.7
989	2.1	5.8	19.7	82.4	154.4	205.2	78.9	20.5	100.9
Total	1.7	5.6	20.4	77.3	150.3	179.1	93.7	19.4	93.9



Table 5b (continued)

	Open regene- ration site	Young seedling stand	Advanced seedling stand	Young thinning stand	Advanced thinning stand	Mature stand	Shelterwood stand	Seed tree stand	Forest land total
		(m <sup>2</sup> /ha)							
<b>Pohjois-Savo</b>									
<i>Municipality</i>									
140	Iisalmi	4.8	20.5	90.6	192.5	256.0	105.8	15.5	111.3
174	Juankoski	9.2	23.2	94.3	208.6	260.0	88.3	29.4	123.7
204	Kaavi	7.3	24.5	92.1	200.6	250.4	69.7	25.2	126.5
227	Karttula	6.4	26.3	97.2	202.2	249.5	60.3	29.9	126.5
239	Keitele	4.6	20.2	91.1	182.1	238.8	57.7	25.8	112.4
263	Kiuruvesi	13.2	5.3	81.8	165.4	251.9	125.0	20.8	95.5
297	Kuopio	6.5	27.7	99.3	213.8	253.1	55.5	31.4	135.9
402	Lapinlahti	10.9	21.1	91.3	192.5	252.4	90.5	23.1	117.8
420	Leppävirta	1.8	29.9	100.9	214.9	249.9	56.6	43.1	145.0
476	Maaninka	8.7	22.9	98.3	205.7	252.2	76.7	28.1	131.4
534	Nilsia	12.5	23.0	93.1	207.3	259.0	98.6	27.9	123.6
595	Pielavesi	10.7	21.5	91.1	182.1	248.7	66.8	24.8	113.6
686	Rautalampi	2.7	23.4	103.6	203.4	245.2	88.8	32.6	124.0
687	Rautavaara	8.5	18.9	84.2	167.3	237.0	113.8	25.6	98.0
749	Siilinjärvi	8.7	21.6	97.2	210.4	253.4	73.8	27.4	122.2
762	Sonkajärvi	10.8	19.7	81.8	165.9	241.8	110.5	20.1	93.4
778	Suonenjoki	2.0	23.5	99.6	202.8	245.8	73.9	30.0	133.3
844	Tervo	8.1	23.9	97.4	202.4	251.9	63.4	27.5	122.3
857	Tuusniemi	3.9	27.5	95.4	209.8	245.1	50.0	28.1	123.1
915	Varkaus	5.0	35.6	110.9	216.0	261.0	96.3	33.1	138.1
916	Varpaisjärvi	12.5	21.3	89.7	191.1	251.2	97.6	23.5	114.7
921	Vesanto	4.4	21.1	99.1	195.6	241.7	57.2	28.8	119.4
925	Vieremä	11.5	21.4	82.2	165.1	246.7	112.1	18.3	93.8
	Total	8.3	23.2	91.0	193.9	249.4	85.8	27.8	116.8

<b>Pohjois-Karjala</b>												
<i>Municipality</i>												
45	Eno	3.3	5.6	18.3	87.1	169.0	246.2	137.1	29.0	102.7		
146	Ilomantsi	0.4	9.5	18.8	82.6	148.9	207.0	92.5	21.5	93.5		
167	Joensuu	4.8	8.5	21.9	94.0	173.0	246.4	54.7	23.7	114.9		
176	Juuka	3.0	5.6	19.9	83.8	157.6	217.5	168.8	8.8	103.2		
248	Kesälahti	10.3	9.1	36.9	109.6	168.3	238.2	60.9	15.6	117.5		
260	Kitee	3.8	7.5	28.4	103.3	186.8	273.6	192.2	16.4	121.8		
276	Kontiolahti	14.6	9.9	27.4	91.8	172.3	270.0	84.7	10.0	117.7		
309	Ourokumpu	6.6	25.9	32.7	109.8	166.8	238.3	0.0	5.8	130.1		
422	Liekka	4.5	9.4	18.2	85.3	155.4	207.4	86.0	27.6	97.0		
426	Liperi	24.9	10.1	34.1	102.0	194.4	254.9	0.1	18.3	121.9		
541	Nurmes	1.5	5.5	22.8	77.5	143.0	219.1	45.8	11.7	92.1		
607	Polvijärvi	9.3	5.3	23.9	100.1	176.1	254.8	3.1	30.5	114.8		
632	Pyhäselkä	6.5	10.1	29.0	96.4	190.8	283.3	103.3	9.2	120.2		
707	Rääkkylä	3.4	10.0	34.7	103.5	199.9	275.0	169.0	4.5	129.8		
848	Tohmajärvi	0.9	15.9	21.1	95.5	168.5	265.4	235.0	20.5	114.2		
911	Valtimo	1.4	4.5	24.5	79.8	144.9	199.7	75.8	17.3	84.6		
	Total	5.2	8.6	22.8	88.3	164.1	231.0	90.8	19.8	104.5		
<b>Kainuu</b>												
<i>Municipality</i>												
105	Hyrynsalmi	3.4	8.6	19.6	67.2	130.7	184.7	107.6	17.0	78.7		
205	Kajaani	10.0	7.7	23.5	74.0	137.9	165.1	114.4	25.2	80.8		
290	Kuhmo	4.6	8.8	19.3	68.6	138.7	201.8	72.7	25.6	83.8		
578	Paltamo	11.3	5.1	21.6	77.3	139.8	188.0	124.3	19.3	85.6		
620	Puolanka	4.5	6.3	18.3	61.3	123.6	173.2	122.1	13.7	73.2		
697	Ristijärvi	4.5	8.0	19.1	70.7	131.4	192.4	119.2	18.2	81.8		
765	Sotkamo	5.7	6.5	22.0	76.3	140.8	198.9	118.5	23.4	85.1		
777	Suomussalmi	3.0	6.6	19.6	58.8	117.6	170.7	104.9	28.2	72.4		
785	Vaala	22.1	8.2	21.4	65.1	124.3	144.8	59.5	7.9	73.8		
	Total	6.2	7.3	20.1	67.5	131.3	183.1	101.0	20.3	78.9		

(continued)

Table 5b (continued)

	Open regene- ration site	Young seedling stand	Advanced seedling stand	Young thinning stand	Advanced thinning stand	Mature stand	Shelterwood stand	Seed tree stand	Forest land total
		(m <sup>2</sup> /ha)							
<b>Pohjois-Pohjanmaa</b>									
<i>Municipality</i>									
9	Alavieska	5.6	23.0	81.2	135.6	163.6	39.0	2.8	88.3
69	Haapajärvi	1.6	26.7	87.8	146.5	188.5	38.9	7.9	98.2
71	Haapavesi	3.2	25.2	84.2	144.9	163.4	38.2	4.4	96.9
72	Hailluoto	7.6	24.1	78.0	132.5	127.4	97.0	8.7	76.4
84	Haukipudas	4.7	22.2	79.5	134.0	138.5	121.9	18.0	81.7
139	Ii	4.3	22.0	77.3	126.4	130.6	89.4	32.8	79.7
208	Kalajoki	1.2	25.2	75.3	129.0	123.9	0.0	3.2	78.7
244	Kempele	2.2	22.1	76.9	129.9	129.9	118.6	32.3	78.1
247	Kestliä	11.7	20.3	74.1	128.3	144.9	125.3	5.6	80.6
255	Kiiminki	5.5	23.0	78.7	136.1	144.3	144.7	21.8	86.5
305	Kuusamo	4.9	16.8	58.2	99.9	133.5	45.6	36.9	68.6
317	Kärsämäki	4.6	23.9	86.6	140.7	179.2	30.3	10.6	95.5
425	Liminka	0.6	21.3	72.3	127.3	130.9	112.9	3.5	73.0
436	Lumijoki	3.1	24.4	81.0	139.4	134.0	96.2	15.4	81.1
483	Merijärvi	2.5	24.1	84.0	136.9	162.5	1.7	2.1	96.3
494	Muhos	2.9	20.6	72.1	122.3	133.0	127.9	7.9	73.3
535	Nivala	2.9	24.5	87.7	145.2	162.5	2.1	6.6	97.6
563	Oulainen	2.6	19.8	80.4	137.1	144.2	39.0	1.7	90.2
564	Oulu	4.7	24.2	84.0	135.1	144.1	133.4	28.3	92.0
567	Oulunsalo	1.1	23.8	78.7	134.2	134.4	153.2	27.2	83.8
603	Piippola	8.5	21.6	78.8	133.1	153.9	37.8	6.9	86.5
615	Pudasjärvi	6.5	18.0	63.1	116.2	134.9	95.9	16.7	67.7
617	Puikkila	5.4	19.8	81.8	138.2	161.3	77.6	6.9	92.4
625	Pyhäjoki	1.0	26.6	78.6	132.1	146.3	39.0	4.0	84.1
626	Pyhäsalmi	3.7	28.1	83.6	133.2	179.5	3.7	14.6	89.6

630	Pyhäntä	19.6	8.1	23.0	73.5	127.5	156.9	39.0	10.7	83.8
678	Raabe	0.3	8.3	28.1	79.7	130.3	165.4	0.0	0.9	90.1
682	Rantsila	5.4	5.9	19.7	74.0	130.1	146.5	113.4	1.3	80.7
691	Reisjärvi	1.1	2.6	25.6	85.0	161.3	197.6	-	16.0	87.7
746	Sievi	1.2	3.6	23.0	78.6	141.5	163.8	-	10.4	82.5
748	Siikajoki	1.9	6.5	22.6	75.3	131.0	141.9	21.4	2.0	80.9
832	Taivalkoski	7.1	8.0	17.5	62.5	112.1	143.6	87.9	16.4	71.9
859	Tymävä	0.2	7.6	20.9	70.1	119.0	129.5	121.4	7.4	70.8
889	Urajärvi	2.6	6.7	20.2	69.0	121.5	158.4	118.0	8.8	75.8
926	Vihanti	1.6	6.5	21.2	76.4	130.8	163.6	39.0	1.2	86.7
972	Yli-Ii	4.5	7.7	20.7	68.2	121.6	128.6	117.6	18.3	71.7
973	Ylikiminki	1.7	6.7	22.1	76.5	129.5	137.7	150.8	13.0	82.8
977	Ylivieska	2.7	4.1	20.9	80.8	134.5	158.1	0.1	4.3	86.8
Total		4.0	7.1	20.8	71.8	127.1	143.1	76.7	15.8	78.7
<b>Lapland</b>										
<i>Municipality</i>										
47	Enontekiö	8.2	18.1	11.3	39.2	69.5	75.8	69.8	27.5	54.9
148	Inari	12.5	15.0	28.1	54.4	61.7	91.7	77.9	20.9	64.5
240	Kemi	7.8	8.1	26.9	76.8	126.1	137.0	129.0	8.0	70.3
241	Keminmaa	9.0	7.4	23.2	79.5	129.5	127.2	76.3	33.3	73.4
261	Kittilä	13.0	12.1	17.6	49.4	70.4	83.1	56.9	22.3	54.3
273	Kolari	13.1	12.0	20.5	55.3	96.9	99.2	79.3	18.5	61.3
320	Kemijärvi	10.2	13.2	16.6	56.5	92.7	103.3	50.9	29.3	59.9
498	Muonio	4.4	19.2	16.2	52.7	81.8	99.9	86.2	20.3	65.2
583	Pelkosenniemi	10.2	8.3	18.8	57.8	99.3	98.3	42.0	25.7	59.4
614	Posio	7.6	9.2	15.6	59.7	94.4	109.6	60.7	40.9	64.2
683	Ranua	12.1	10.5	18.7	55.1	100.8	96.0	33.2	24.5	54.3
698	Rovaniemi	12.8	15.5	18.2	56.7	103.4	102.4	78.0	22.0	58.9
732	Salla	8.5	12.0	15.0	57.8	97.2	89.9	63.4	34.1	62.2
742	Savukoski	13.0	11.9	15.9	54.0	85.2	86.3	30.1	26.4	58.4
751	Simo	4.4	9.7	23.4	71.7	113.6	116.8	99.1	27.6	71.7

(continued)

Table 5b (continued)

	Open regene- ration site	Young seedling stand	Advanced seedling stand	Young thinning stand	Advanced thinning stand	Mature stand	Shelterwood stand	Seed tree stand	Forest land total
758	13.3	11.5	18.0	46.0	67.7	80.7	49.5	24.2	54.1
845	5.1	10.4	21.7	69.5	121.1	123.5	31.2	22.3	68.6
851	7.5	8.1	21.5	74.8	134.6	132.2	65.3	17.0	71.8
854	16.1	13.0	19.5	58.4	103.1	104.8	58.7	21.1	60.0
890	–	19.5	14.2	54.7	43.6	72.5	72.2	13.7	53.9
976	6.9	12.7	21.3	62.0	108.7	101.9	84.2	24.6	62.3
Total	11.4	12.6	19.4	55.7	85.6	91.2	70.3	24.2	60.0



**Table 6a** The mean volume of growing stock by tree species and roundwood assortment on forest and poorly productive forest land (By forestry centres).

	(m <sup>3</sup> /ha)												
	Pine			Spruce			Birch			Other deciduous tree species			
	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	
<b>Åland</b>													
<i>Municipality</i>													
35 Brändö	28.5	0.7	26.0	0.9	0.1	0.8	14.9	0.0	12.8	17.3	0.1	10.2	61.6
43 Eckerö	64.7	7.3	55.1	28.5	7.1	18.8	12.8	0.3	10.5	6.4	0.1	5.0	112.4
60 Finström	63.7	7.4	54.1	32.1	8.2	21.3	14.8	0.5	12.1	9.1	0.2	7.2	119.7
62 Föglö	65.9	7.1	56.3	22.0	5.6	14.7	10.4	0.2	8.3	10.2	0.2	6.7	108.5
65 Geta	58.8	5.5	50.8	21.9	5.2	14.8	8.8	0.3	7.1	4.5	0.1	3.4	94.0
76 Hammarland	64.5	7.1	55.1	29.9	7.4	20.0	14.7	0.4	12.1	8.6	0.2	6.8	117.6
170 Jomala	68.6	8.6	57.9	35.5	9.0	23.6	15.5	0.6	12.7	10.0	0.2	7.9	129.6
295 Kumlinge	48.3	4.1	42.0	8.2	1.6	5.9	12.1	0.1	9.9	13.6	0.3	9.0	82.2
318 Kökar	28.8	3.9	23.3	4.9	0.4	4.3	17.9	0.0	13.4	22.3	0.5	13.8	73.8
417 Lemland	62.5	7.4	53.0	32.2	8.4	21.3	16.4	0.5	13.4	10.5	0.3	8.3	121.6
438 Lumparland	68.6	7.5	58.7	26.6	6.6	17.8	10.1	0.3	8.2	7.1	0.2	5.2	112.4
478 Mariehamn	54.2	5.0	47.0	19.3	4.3	13.4	11.9	0.4	9.7	9.1	0.1	6.9	94.6
736 Saltvik	67.6	7.1	58.1	27.6	6.8	18.5	10.0	0.3	8.1	5.7	0.1	4.3	110.9
766 Sottunga	41.3	3.9	35.5	10.2	2.4	7.1	12.2	0.1	9.4	13.3	0.2	8.4	77.0
771 Sund	65.6	7.2	56.1	27.8	6.7	18.8	12.1	0.4	9.7	7.6	0.2	5.8	113.1
941 Vårdö	59.4	5.8	51.2	20.2	4.8	13.7	8.6	0.2	6.9	6.1	0.1	4.3	94.3
<b>Total</b>													
Multi-source inventory	60.6	6.5	51.8	24.7	6.1	16.5	12.7	0.3	10.4	9.2	0.2	6.6	107.2
Field inventory	57.6			23.2			12.3			11.0			104.1
SE of field inventory	2.7			2.5			1.0			1.5			5.0

(continued)



606	Pohja-Pojo	63.4	20.6	40.3	42.9	17.0	23.3	14.1	2.9	9.3	4.5	1.0	2.9	124.8
638	Porvoo-Borgå	46.3	14.4	30.2	74.0	30.8	38.9	21.6	4.2	14.8	7.8	1.0	5.8	149.7
701	Ruotsinpyhtää-Strömfors	46.6	15.4	29.2	64.4	24.8	35.7	24.8	4.4	18.6	5.7	0.7	4.0	141.5
753	Sipoo-Sibbo	44.8	16.1	27.1	78.9	35.2	39.1	26.9	6.4	17.2	10.7	1.2	7.9	161.3
755	Siuntio-Sjundeå	47.7	22.6	23.6	83.3	44.8	34.5	21.9	5.9	13.9	10.7	3.3	5.2	163.6
835	Ekenäs-Tammisaari	65.7	20.1	43.3	38.8	15.5	21.3	13.6	2.6	9.2	4.7	1.1	3.0	122.8
923	Västmanfjärd	70.3	25.0	42.5	37.8	16.3	19.7	10.6	2.2	6.9	3.1	0.5	1.9	121.7
Total														
	Multi-source inventory	56.2	18.9	35.0	53.8	23.5	27.4	18.2	4.0	12.2	6.8	1.3	4.3	135.1
	Field inventory	55.4			54.2			20.5			9.3			139.5
	SE of field inventory	2.2			2.9			1.2			0.8			3.3
<b>Rannikko/Pohjanmaa</b>														
<i>Municipality</i>														
231	Kaskinen-Kaskö	26.5	6.3	18.6	53.2	16.5	33.8	17.5	1.1	13.0	6.5	0.0	4.3	103.7
272	Kokkola-Karleby	42.8	9.4	30.5	32.2	9.8	20.4	20.5	1.0	16.0	3.0	0.2	2.0	98.6
280	Korsnäs	30.0	8.4	19.3	44.6	13.6	27.8	25.2	1.9	18.8	2.6	0.2	1.7	102.4
287	Kristinestad-Kristinankaupunki	38.9	11.5	24.8	54.5	16.8	34.5	17.5	1.4	13.4	3.3	0.5	2.2	114.2
288	Kronoby-Kruunupyö	51.2	11.7	35.8	27.4	9.0	16.9	16.1	0.7	12.4	1.6	0.1	1.1	96.3
440	Larsmo-Luoto	39.5	8.8	27.8	28.1	8.8	17.6	17.0	0.8	12.9	3.1	0.2	2.0	87.7
475	Malax-Maalähti	30.3	7.7	20.1	37.5	12.8	22.1	22.8	1.6	16.8	3.6	0.5	2.5	94.2
499	Korsholm-Mustasaari	25.3	7.5	16.3	52.6	19.4	30.7	18.8	1.2	13.9	5.3	0.3	4.2	102.1
545	Närpes-Närpiö	36.5	11.0	23.3	51.5	16.5	32.1	18.4	1.2	13.8	2.9	0.3	1.9	109.2

(continued)

Table 6a (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Total		Logs	Total		Logs	Total		Logs	Total		Logs	
	Logs	Pulpwood		Logs	Pulpwood		Logs	Pulpwood		Logs	Pulpwood		
	(m <sup>3</sup> /ha)												
559 Oravais-Oravainen	35.3	8.1	25.0	33.7	10.3	21.0	20.6	1.5	15.4	3.0	0.3	2.1	92.5
598 Jakobstad-Pietarsaari	37.0	6.9	27.7	26.4	6.6	17.4	23.7	1.3	18.6	3.4	0.3	2.4	90.5
599 Pedersöre-Pedersören kunta	46.0	10.8	31.9	26.8	7.9	17.1	17.1	0.9	13.3	1.9	0.2	1.4	91.9
893 Nykarleby-Uusikaarlepyy	39.4	8.5	27.9	26.5	7.1	17.0	18.2	1.1	13.9	1.8	0.1	1.3	85.9
905 Vaasa-Yasa	28.4	9.1	17.9	61.1	21.2	37.0	20.9	1.8	16.0	5.9	0.3	4.7	116.4
945 Vöörä-Maximo-Vöyri-Maksamaa	32.7	8.0	22.7	48.1	16.8	28.1	21.3	1.9	15.4	5.3	0.4	4.0	107.5
Total	37.6	9.6	25.4	40.3	13.1	24.8	19.0	1.3	14.3	3.2	0.3	2.3	100.0
Multi-source inventory				43.0			18.1			4.0			101.7
Field inventory	36.6			1.9			0.9			0.5			2.7
SE of field inventory	1.5												
<b>Lounais-Suomi</b>													
<i>Municipality</i>													
6 Alastaro	56.6	22.1	32.5	64.6	30.7	30.3	18.7	2.3	13.2	4.0	0.4	2.7	144.0
17 Askainen	83.0	34.1	46.2	33.9	12.4	19.3	9.9	1.6	6.9	7.2	0.9	5.2	134.0
19 Aura	65.1	30.7	32.0	60.6	28.0	29.4	13.8	2.2	9.0	6.3	1.0	4.5	145.7
50 Eura	62.9	24.4	35.9	55.3	24.3	27.5	17.6	2.0	12.2	4.0	0.6	2.7	139.7
51 Eurajoki	64.0	26.0	35.4	57.9	24.5	29.9	17.4	1.7	12.3	5.0	0.7	3.5	144.3
73 Halikko	71.7	30.8	38.4	53.3	23.8	27.2	13.7	2.9	8.7	6.8	1.0	4.7	145.5
79 Harjavalta	57.8	18.9	36.2	53.1	22.3	27.3	19.9	2.1	14.1	3.2	0.4	2.2	134.0
99 Honkajoki	61.1	17.7	39.9	11.8	4.2	6.7	13.2	0.7	10.0	2.0	0.2	1.4	88.1
102 Huittinen	46.9	16.4	28.5	75.1	34.6	36.0	23.5	3.0	16.5	3.5	0.4	2.2	148.9
181 Jämijärvi	56.3	19.6	33.4	40.7	19.0	19.3	16.5	1.9	12.1	3.6	0.3	2.6	117.1

202	Kaarina	68.1	26.2	39.3	36.8	15.5	19.6	10.4	1.8	7.0	7.2	0.9	4.8	122.5
214	Kankaanpää	56.0	17.3	35.4	33.5	15.7	15.8	15.2	1.5	11.2	2.6	0.2	1.8	107.3
230	Karvia	59.0	16.4	39.4	13.8	5.0	7.8	12.8	0.7	9.5	2.0	0.3	1.4	87.5
252	Kiikala	63.9	29.6	32.2	65.2	31.7	30.4	15.1	2.5	10.0	5.3	0.8	3.6	149.5
254	Kiikoinen	50.5	17.7	30.0	61.7	29.3	28.8	18.0	2.4	13.1	3.3	0.3	2.3	133.4
259	Kisko	65.9	30.5	33.2	60.9	28.7	29.1	15.2	2.7	9.9	6.0	1.1	4.1	148.0
262	Kuikka	57.4	22.6	32.5	63.1	26.1	32.9	19.9	2.2	14.1	4.7	0.7	3.2	145.0
271	Kokemäki	59.3	21.2	35.3	57.1	25.0	28.5	18.0	2.2	12.6	3.0	0.4	2.0	137.4
284	Koski Tl	49.5	20.8	27.0	88.4	45.3	38.7	19.5	2.4	13.7	4.1	0.4	2.7	161.4
304	Kustavi	78.1	29.3	46.1	24.1	7.6	14.6	9.0	1.8	6.1	8.9	1.7	6.1	120.1
308	Kuusjoki	60.4	27.9	30.5	79.1	38.2	37.2	16.8	2.5	11.4	5.8	0.9	4.0	161.9
319	Köyliö	62.2	24.0	35.6	51.9	23.7	25.1	16.9	2.1	11.9	3.3	0.5	2.3	134.3
400	Laitila	69.4	27.8	38.9	50.9	21.8	26.0	14.5	1.4	10.0	3.9	0.5	2.7	138.7
406	Lappi	68.1	26.9	38.3	50.2	22.0	25.2	14.0	1.5	9.7	3.7	0.5	2.5	136.0
413	Lavia	52.9	19.3	30.7	53.1	23.5	26.2	18.8	2.4	13.8	3.5	0.3	2.5	128.2
419	Lemu	67.5	27.2	37.6	36.9	15.2	19.7	10.2	1.1	7.3	4.9	0.6	3.3	119.4
423	Lieto	71.8	32.9	36.5	55.2	25.9	26.6	11.6	1.7	7.7	5.3	0.8	3.8	143.9
430	Loimaa	49.9	20.9	27.2	87.9	45.4	38.4	18.7	2.2	13.2	4.1	0.4	2.6	160.6
442	Luvia	59.6	23.6	32.8	78.8	34.0	39.6	24.9	2.0	18.5	3.6	0.6	2.5	166.9
480	Marttila	58.0	25.0	30.9	66.7	31.7	31.5	16.9	2.4	11.5	5.2	0.7	3.7	146.8
481	Masku	65.1	25.9	36.4	44.0	18.7	22.9	11.7	1.3	8.2	5.5	0.7	3.8	126.3
482	Mellilä	49.7	18.1	29.4	71.8	36.2	31.7	18.8	2.1	13.2	3.5	0.3	2.3	143.9
484	Merikarvia	55.5	17.2	34.2	46.3	18.8	24.3	17.5	1.9	12.6	3.5	0.3	2.5	122.8
485	Merimasku	87.6	35.4	49.2	30.4	10.7	17.5	9.6	1.8	6.6	8.2	1.4	5.9	135.8
501	Muurila	71.0	33.2	35.5	57.1	26.6	27.7	14.5	2.5	9.3	5.9	1.0	4.1	148.5
503	Mynämäki	61.1	23.5	34.9	48.5	21.6	23.9	15.5	1.8	10.8	4.1	0.5	2.9	129.1
529	Naantali	81.6	32.3	46.4	31.9	12.0	18.0	8.7	1.4	6.0	6.3	0.8	4.5	128.5
531	Nakkila	50.4	18.3	29.7	70.0	30.2	35.1	24.0	2.4	17.5	3.7	0.5	2.5	148.0

(continued)

Table 6a (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	
	(m <sup>3</sup> /ha)												
537 Noormarkku	49.7	19.5	27.7	66.2	30.5	31.9	20.0	2.5	14.6	3.0	0.4	2.1	138.8
538 Nousiainen	67.8	28.5	36.9	58.8	28.3	27.5	13.5	1.8	9.3	3.3	0.5	2.2	143.4
561 Oripää	67.9	27.8	37.5	48.4	22.3	23.3	15.7	2.1	10.7	4.1	0.6	2.9	136.0
577 Paonio	74.3	31.6	40.2	45.2	20.0	23.3	11.2	2.0	7.4	5.1	0.6	3.5	135.8
586 Perniö	73.8	34.1	37.3	56.9	26.7	27.6	13.8	2.6	8.8	5.3	0.9	3.7	149.9
587 Pertteli	66.9	31.5	33.3	61.9	29.0	29.9	14.4	2.4	9.3	6.0	1.1	4.1	149.2
602 Piikkiö	72.5	30.0	40.0	44.1	19.6	22.7	10.2	1.9	6.8	5.6	0.6	3.8	132.4
608 Pomarkku	54.8	21.9	30.4	74.0	35.4	34.7	18.3	2.3	13.4	2.9	0.3	2.0	150.0
609 Pori	49.4	18.6	28.0	66.8	28.7	33.7	22.0	2.1	16.0	3.8	0.5	2.7	141.9
631 Pyhärinta	74.6	31.5	40.7	53.2	22.0	28.0	14.7	1.7	10.0	4.8	0.7	3.3	147.3
636 Pöytyä	61.6	27.5	31.7	61.3	28.4	29.6	15.8	2.4	10.7	5.5	0.9	3.9	144.1
680 Raisio	68.7	27.8	38.3	38.3	16.6	19.7	10.1	1.5	7.0	7.1	1.0	4.7	124.2
684 Rauma	71.4	28.8	39.7	48.2	19.8	25.3	14.0	1.4	9.8	5.0	0.6	3.5	138.5
704 Rusko	65.8	27.0	36.1	47.3	20.6	24.1	11.5	1.3	8.1	6.0	0.9	4.2	130.6
705 Rymättylä	79.9	29.1	47.8	24.1	8.6	13.9	6.7	1.2	4.6	6.4	1.0	4.5	117.0
734 Salo	67.5	30.3	34.7	54.6	24.8	27.2	14.6	2.4	9.4	6.3	1.1	4.4	143.0
738 Sauvo	69.6	27.7	39.2	39.5	16.7	20.8	10.7	1.7	7.3	5.4	0.7	3.6	125.1
747 Siikainen	55.9	17.5	34.9	41.5	17.9	20.9	17.3	1.9	12.5	3.6	0.2	2.5	118.2
761 Somero	52.4	22.0	28.5	80.1	39.9	36.3	20.3	2.9	14.1	5.6	0.8	3.7	158.4
776 Suomensjärvi	59.9	26.8	31.1	64.4	32.5	29.0	14.8	2.5	9.8	5.8	0.9	3.9	144.8
783 Säkylä	66.7	26.7	37.5	49.8	23.2	23.8	14.8	1.9	10.4	3.4	0.5	2.4	134.8
784 Särkisalo-Finby	71.2	31.1	37.7	56.0	25.2	28.2	12.8	2.8	8.1	7.2	1.1	4.8	147.3
833 Taivassalo	81.9	31.7	47.3	26.1	9.0	15.2	8.5	1.5	5.8	6.8	1.0	4.9	123.3
838 Tarvasjoki	63.8	29.7	32.0	64.0	29.1	31.6	14.5	2.4	9.4	6.9	1.2	4.9	149.3
853 Turku-Åbo	66.6	26.3	37.7	37.1	15.7	19.4	11.0	1.6	7.5	7.1	1.0	4.8	121.9

886	Ulvila	51.5	18.9	29.9	58.5	25.1	29.6	20.8	2.5	15.1	3.1	0.3	2.2	133.8
895	Uusikaupunki	69.6	27.5	39.3	33.9	13.1	18.7	11.3	1.2	8.0	5.2	0.6	3.6	120.0
906	Vahto	65.6	27.4	35.8	58.6	27.8	27.6	15.2	2.1	10.6	3.7	0.5	2.6	143.1
913	Vampula	49.7	19.5	28.4	79.0	36.4	38.4	23.7	3.2	16.7	4.2	0.5	2.8	156.6
918	Vehmaa	71.5	28.4	40.2	32.9	12.8	18.3	10.6	1.2	7.5	5.4	0.5	3.6	120.4
920	Velkua	78.5	27.6	48.1	18.0	5.3	11.7	6.5	1.4	4.4	8.3	1.6	5.8	111.4
979	Yläne	62.5	24.3	35.5	51.1	23.5	24.7	16.3	2.1	11.4	3.5	0.5	2.4	133.3
<b>Total</b>														
	Multi-source inventory	61.3	23.7	34.9	52.3	23.5	25.8	16.1	2.0	11.3	4.3	0.6	3.0	134.0
	Field inventory	61.9			53.9		16.4				4.5			136.6
	SE of field inventory	1.2			1.7		0.5				0.4			2.0
<b>Häme-Uusimaa</b>														
<i>Municipality</i>														
15	Artjärvi	39.1	18.7	18.6	80.1	38.5	37.0	16.5	3.9	10.5	6.3	0.5	4.2	142.1
16	Asikkala	41.6	22.4	17.7	81.7	42.8	35.2	23.3	5.8	14.9	9.3	1.2	6.0	155.8
18	Askola	41.4	21.8	18.4	93.9	44.3	44.9	21.9	6.0	13.5	6.3	0.9	3.8	163.6
61	Forssa	41.6	18.8	21.5	90.8	47.4	38.9	19.2	3.2	13.3	2.4	0.4	1.6	153.9
81	Hartola	40.9	20.3	19.5	75.5	35.6	36.5	29.1	6.5	19.8	9.4	1.1	5.5	154.9
82	Hattula	43.7	18.4	23.6	70.6	33.8	32.7	26.3	5.6	17.7	2.9	0.6	1.9	143.5
83	Hauho	39.2	19.8	18.5	108.4	59.0	45.0	19.1	3.7	13.4	8.6	1.1	6.5	175.4
86	Hausjärvi	41.0	17.6	21.8	90.9	49.4	37.7	18.2	3.9	12.0	6.1	1.1	3.4	156.2
98	Hollola	35.0	18.1	15.4	89.8	47.7	37.9	15.5	2.9	10.3	8.1	1.1	5.1	148.3
103	Hummppila	38.2	16.6	20.5	101.4	50.6	47.0	22.3	3.0	16.8	2.3	0.3	1.7	164.2
106	Hyvinkää	43.2	17.4	23.7	84.3	45.4	35.3	19.6	4.2	12.8	6.4	1.0	3.8	153.5
109	Hämeenlinna	40.0	17.9	20.7	80.5	40.7	35.7	25.3	5.2	17.2	6.2	0.9	4.3	151.9
111	Heinola	55.5	27.8	25.4	55.5	25.4	27.5	23.2	5.6	14.8	7.1	0.7	4.3	141.2
165	Janakkala	38.8	17.6	19.9	94.5	51.1	39.3	21.1	4.0	14.6	5.8	1.0	3.8	160.1

(continued)

Table 6a (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	
	(m <sup>3</sup> /ha)												
169	46.9	21.7	23.9	97.5	50.4	42.5	18.8	3.0	13.2	2.9	0.4	2.1	166.1
186	25.5	10.9	13.3	79.4	40.2	35.5	21.3	3.8	13.6	11.5	1.4	5.7	137.8
210	41.1	16.3	23.0	79.1	37.9	36.9	24.4	4.4	17.1	1.7	0.2	1.1	146.3
223	51.6	21.0	28.5	61.9	32.4	27.0	17.9	3.0	11.8	3.2	0.5	2.0	134.5
224	44.2	19.4	23.0	90.1	48.8	37.2	21.2	4.6	14.4	6.0	0.8	4.1	161.5
245	30.4	14.3	14.4	82.1	36.8	40.8	25.2	5.1	16.0	12.2	1.0	7.4	149.8
283	29.2	13.8	14.1	101.2	53.0	43.5	17.3	2.8	12.3	6.3	1.0	4.1	154.0
316	32.7	14.0	17.1	99.0	53.2	41.7	18.8	3.9	12.4	6.3	0.8	3.8	156.8
398	34.9	18.6	15.0	68.2	34.6	29.9	15.8	3.0	9.7	14.1	1.6	8.9	132.9
401	33.8	16.0	16.5	94.6	50.1	39.8	16.9	2.6	12.3	5.7	0.8	3.8	150.9
433	43.0	18.4	22.9	88.6	47.9	36.7	21.1	4.5	14.1	4.6	0.7	3.2	157.2
444	47.9	22.1	24.2	76.8	42.1	31.3	20.9	4.0	14.2	8.2	1.2	4.9	153.7
504	42.3	20.6	20.1	84.1	38.8	40.6	21.3	5.3	13.5	5.4	0.8	3.2	153.1
	Mörskom												
505	36.5	15.9	19.0	108.2	58.8	45.1	18.2	4.3	11.6	5.7	0.8	3.3	168.6
532	45.8	24.3	20.0	59.3	29.3	27.1	17.0	3.8	10.4	10.3	1.3	6.4	132.4
540	47.5	20.1	25.6	73.3	37.1	32.6	20.1	3.8	13.8	4.4	0.7	3.0	145.3
543	36.8	14.8	20.0	85.6	44.5	37.2	21.7	4.7	14.3	11.0	1.5	6.9	155.0
560	36.9	18.4	17.0	78.6	41.0	33.6	14.9	3.2	9.3	6.7	0.8	4.1	137.1
576	44.9	24.5	18.9	90.4	50.7	35.4	21.3	4.4	14.8	6.2	0.9	4.1	162.7
611	36.8	18.6	16.8	85.9	39.4	42.2	22.7	5.1	14.5	8.0	1.3	4.5	153.4
616	32.9	15.8	15.7	86.9	44.3	38.4	20.0	4.3	13.0	7.2	1.0	4.0	147.0
692	49.1	22.4	24.9	85.3	46.8	34.7	21.2	5.1	13.6	2.7	0.5	1.7	158.1
694	36.9	15.5	19.8	92.9	51.5	37.5	20.6	4.4	13.6	8.0	1.5	4.8	158.4
737	50.2	21.0	27.2	60.3	30.8	26.9	18.7	3.2	12.6	3.6	0.6	2.2	132.8



781	Sysmä	46.5	24.2	20.8	74.2	35.3	35.3	29.6	7.0	19.9	10.5	1.3	6.8	160.8
834	Tammela	48.5	20.0	26.7	77.1	39.4	33.6	20.3	3.5	14.3	2.4	0.2	1.8	148.3
855	Tuulos	32.7	15.6	16.0	95.4	51.1	40.0	16.6	2.8	11.8	5.5	0.8	3.8	150.2
858	Tuusula	33.1	13.8	17.6	91.8	46.4	41.4	22.4	4.6	14.5	10.7	1.4	6.5	158.0
927	Vihtu	45.6	19.5	24.2	83.4	43.9	35.4	23.0	5.2	15.4	11.2	1.6	7.6	163.1
981	Ypäjä	46.8	22.3	23.3	99.5	49.4	45.5	20.5	3.3	14.4	3.3	0.4	2.3	170.0
Total	Multi-source inventory	42.3	19.9	20.8	83.3	43.1	36.3	21.2	4.5	14.2	6.7	0.9	4.3	153.5
	Field inventory	40.6			82.8			21.7			8.3			153.3
	SE of field inventory	1.3			2.0			0.7			0.5			2.2
<b>Kaakkois-Suomi</b>														
<i>Municipality</i>														
44	Elimäki	40.6	16.5	22.4	83.4	39.7	39.6	17.8	3.4	12.0	5.5	0.7	3.7	147.3
75	Hamina	59.4	19.5	37.0	58.4	25.3	30.1	12.8	2.2	8.8	3.3	0.4	2.2	134.0
142	Iitti	43.6	15.7	25.7	68.0	31.5	33.0	18.6	3.3	12.5	5.9	0.7	3.8	136.0
153	Imatra	54.6	25.4	27.2	63.2	28.5	31.9	23.6	5.2	15.6	7.9	1.1	4.2	149.2
163	Jaala	73.7	31.2	39.1	45.7	19.1	23.9	23.1	4.0	16.3	6.0	0.5	4.2	148.5
173	Joutseno	58.1	28.0	28.1	62.5	29.2	30.4	24.7	5.6	16.3	8.8	1.3	4.9	154.1
285	Kotka	53.9	20.4	30.8	53.3	23.5	26.8	19.1	3.4	13.4	5.5	0.5	3.7	131.7
286	Kouvola	44.0	13.0	28.8	50.0	20.8	26.2	18.2	2.9	12.2	5.9	0.6	3.7	118.1
306	Kuusankoski	47.4	15.1	29.8	61.0	26.6	31.1	19.8	3.2	13.5	6.0	0.6	3.9	134.2
405	Lappeenranta	57.3	22.0	32.4	67.1	33.5	30.6	16.8	3.3	11.5	4.9	0.7	3.0	146.1
416	Lemi	63.8	28.6	32.6	62.5	31.5	28.2	21.9	4.8	14.6	6.8	0.9	4.2	154.9
441	Luumäki	62.4	20.7	38.4	60.0	27.4	29.6	14.7	2.7	10.2	3.2	0.4	2.2	140.4
489	Miehikkälä	59.5	17.7	38.2	56.5	24.3	29.2	11.0	1.7	7.8	2.4	0.3	1.6	129.5
580	Parikkala	53.9	23.5	28.0	41.0	16.3	22.3	19.6	3.4	13.2	8.0	0.4	4.6	122.6
624	Pyhtää-Pyttis	49.1	19.2	27.4	59.1	26.4	29.4	22.4	4.6	15.2	6.2	0.6	4.1	136.8
689	Rautjärvi	57.9	27.0	28.9	55.2	25.8	26.6	22.8	4.7	15.3	7.9	0.8	4.5	143.9

(continued)



418	Lempäälä	34.3	15.0	17.8	88.1	40.2	42.9	23.7	3.0	17.5	5.0	0.8	3.4	151.0
493	Mouhijärvi	41.6	15.7	23.7	68.6	30.1	34.3	19.2	2.3	14.1	3.4	0.6	2.2	132.8
506	Mänttää	45.0	19.5	23.7	77.4	36.9	36.2	25.9	3.2	18.9	3.9	0.4	2.8	152.2
536	Nokia	38.9	16.4	20.6	75.6	33.5	37.5	20.3	2.5	14.8	4.0	0.7	2.6	138.7
562	Orivesi	41.0	16.7	22.4	77.7	36.6	36.8	19.4	2.7	13.9	3.7	0.4	2.5	141.9
581	Parkano	60.2	18.9	38.0	25.7	10.8	13.1	14.6	1.2	10.8	1.8	0.2	1.3	102.3
604	Pirkkala	34.0	15.2	17.3	81.5	36.5	40.3	23.6	2.8	17.5	5.2	0.9	3.5	144.3
619	Punkalaidun	49.4	20.0	27.6	89.1	45.5	39.1	18.6	2.1	13.1	3.2	0.3	2.0	160.3
635	Pälkäne	39.8	17.7	20.7	91.7	43.1	43.6	25.2	4.2	17.7	7.3	1.2	4.9	164.0
702	Ruovesi	51.5	21.7	27.6	75.5	36.5	35.2	18.0	2.3	13.1	2.7	0.3	1.9	147.7
837	Tampere	39.4	16.4	21.2	83.0	39.2	39.3	21.8	2.8	16.2	4.4	0.7	3.0	148.6
887	Urjala	44.6	18.5	24.2	79.4	38.4	36.7	20.4	2.8	14.7	3.2	0.4	2.2	147.5
908	Valkeakoski	35.9	15.3	19.1	80.7	36.3	39.5	24.9	3.4	18.0	5.5	0.6	3.9	147.0
912	Vammala	44.8	16.9	25.7	67.1	30.4	32.5	18.8	2.2	13.8	3.0	0.5	2.0	133.7
922	Vesilähti	40.3	18.1	20.6	92.1	46.1	41.3	18.5	2.5	13.5	3.3	0.5	2.2	154.2
933	Vilppula	49.9	22.0	25.9	74.8	36.4	34.5	20.9	2.8	15.1	3.2	0.4	2.2	148.8
936	Virrat	58.0	18.8	35.9	38.3	16.8	19.1	15.7	1.4	11.5	2.3	0.2	1.7	114.3
980	Ylöjärvi	40.3	16.4	22.0	75.5	35.6	35.7	21.6	2.5	16.0	4.1	0.6	2.7	141.5
988	Äetsä	48.2	17.0	28.7	58.1	25.6	28.6	16.9	2.0	12.2	2.6	0.4	1.7	125.7
Total														
	Multi-source inventory	47.6	18.1	27.2	65.1	30.2	31.2	19.4	2.3	14.2	3.3	0.4	2.3	135.5
	Field inventory	47.8			63.6			19.8			4.7			135.9
	SE of field inventory	1.2			1.7			0.7			0.4			2.1
<b>Etelä-Savo</b>														
<i>Municipality</i>														
46	Enonkoski	54.2	25.6	26.5	56.2	24.3	28.3	19.2	3.9	12.8	6.5	0.5	3.7	136.0
90	Heinävesi	46.2	14.5	29.6	58.3	28.0	26.9	15.5	2.8	10.3	5.0	0.5	2.7	125.1

(continued)



10	Alavus	63.7	20.7	38.8	16.0	6.7	8.3	12.4	0.6	9.1	1.1	0.1	0.8	93.2
52	Evijärvi	51.5	12.9	34.7	21.1	8.1	12.0	13.1	0.7	9.9	1.4	0.1	1.1	87.2
74	Halsua	45.8	8.6	32.6	4.8	1.5	2.7	13.1	0.4	9.5	1.9	0.0	1.3	65.6
95	Himanka	53.7	11.2	38.2	22.2	7.4	13.3	19.5	0.5	15.2	1.9	0.1	1.4	97.3
145	Ilmajoki	46.5	14.8	28.6	41.9	18.6	21.2	12.5	1.0	8.8	2.4	0.7	1.5	103.4
151	Isojoki	46.7	13.2	30.0	32.9	13.3	17.8	14.4	0.8	11.2	2.2	0.3	1.6	96.2
152	Isokyrö	36.8	8.4	24.7	35.0	13.3	19.2	15.9	1.2	11.3	3.0	0.3	2.1	90.7
164	Jalasjärvi	57.3	16.2	37.2	22.0	9.5	11.3	12.8	0.5	9.4	1.5	0.1	1.1	93.6
175	Jurva	42.6	14.2	25.8	42.4	16.8	23.4	15.1	0.9	11.5	2.2	0.3	1.6	102.4
217	Kannus	50.0	10.8	35.0	15.5	5.3	9.0	21.1	0.5	16.4	1.6	0.1	1.1	88.1
218	Karjajoki	46.4	14.5	29.0	36.4	13.0	21.4	13.1	0.7	9.8	1.7	0.2	1.2	97.6
232	Kauhajoki	47.0	11.2	32.1	17.1	6.5	9.5	9.4	0.4	7.2	1.0	0.1	0.8	74.5
233	Kauhava	55.2	15.3	36.0	19.8	7.7	11.0	13.3	0.8	9.9	1.3	0.1	1.0	89.6
236	Kaustinen	48.5	10.8	33.0	10.8	4.0	6.1	14.5	0.4	10.9	1.0	0.0	0.7	74.8
281	Kortesjärvi	51.4	12.2	35.1	18.9	6.8	10.9	12.6	0.6	9.5	1.3	0.1	1.0	84.2
300	Kuortane	64.5	23.5	37.0	22.0	9.5	11.4	11.2	0.7	8.1	0.8	0.1	0.6	98.5
301	Kurikka	50.5	17.5	30.1	31.5	13.3	16.5	11.4	0.5	8.4	1.6	0.2	1.1	95.0
315	Kälviä	47.1	10.2	32.7	15.8	5.6	9.2	16.5	0.5	12.5	1.3	0.0	1.0	80.8
399	Laihia	39.1	11.2	24.9	41.1	16.6	22.0	18.3	1.2	13.3	3.2	0.3	2.4	101.7
403	Lappajärvi	55.3	14.3	37.0	18.2	7.0	10.1	15.9	0.7	12.1	1.4	0.1	1.0	90.7
408	Lapua	53.5	16.2	33.4	24.8	10.3	13.2	14.3	0.9	10.4	2.0	0.1	1.4	94.6
414	Lehtimäki	59.3	20.4	35.3	14.1	5.9	7.4	11.2	0.5	8.2	1.0	0.1	0.7	85.6
421	Lestijärvi	49.1	11.6	32.9	11.0	4.5	5.7	13.2	0.5	9.6	2.0	0.0	1.3	75.3
429	Lohtaja	47.7	10.1	33.5	16.1	5.4	9.6	15.6	0.4	11.9	1.3	0.0	1.0	80.7
544	Nurmo	50.3	15.3	31.4	21.7	9.1	11.4	12.5	0.5	9.0	1.5	0.1	1.1	86.0
584	Perho	47.2	8.4	33.9	4.9	1.7	2.7	8.4	0.2	5.7	1.9	0.1	1.2	62.3
743	Seinäjoki	53.6	14.3	35.1	16.4	6.8	8.5	14.7	0.7	10.8	1.7	0.2	1.2	86.3
759	Soini	60.8	18.5	38.1	17.4	7.4	8.9	12.1	0.5	8.9	1.3	0.1	0.9	91.7
846	Teuva	43.3	14.4	26.3	37.1	14.5	20.7	12.7	0.6	9.6	1.6	0.2	1.1	94.7

(continued)

Table 6a (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	
	(m <sup>3</sup> /ha)												
849	50.3	12.9	33.4	14.1	5.8	7.4	18.2	0.7	13.7	2.6	0.0	1.8	85.1
863	69.0	25.5	39.3	22.8	10.5	11.1	9.6	0.6	6.8	0.8	0.0	0.5	102.2
885	54.2	12.7	36.9	12.1	5.4	6.1	15.5	0.5	11.6	2.0	0.0	1.4	83.8
924	50.7	12.0	34.2	16.2	6.5	8.8	15.7	0.6	12.0	2.2	0.2	1.5	84.8
934	53.4	13.8	35.2	14.8	6.1	7.8	15.3	0.8	11.4	1.9	0.2	1.3	85.4
942	29.6	8.2	19.4	43.4	14.9	25.6	18.2	1.5	12.9	7.4	0.4	5.9	98.6
971	42.7	9.8	29.2	23.1	7.6	14.2	14.6	1.2	10.8	2.4	0.1	1.9	82.8
975	41.1	12.3	25.6	33.8	13.1	18.5	15.0	1.1	10.6	2.2	0.3	1.5	92.2
989	58.4	18.6	36.0	25.1	11.6	12.0	12.0	0.9	8.5	1.4	0.1	0.9	96.9
Total													
Multi-source inventory	51.3	14.2	33.3	21.2	8.5	11.4	13.5	0.6	10.0	1.7	0.1	1.2	87.7
Field inventory	51.2			21.5			14.6			2.3			89.6
SE of field inventory	1.0			0.9			0.5			0.2			1.4
<b>Keski-Suomi</b>													
<i>Municipality</i>													
77 Hankasalmi	42.1	17.8	22.3	71.6	36.2	32.5	18.4	3.7	12.4	6.0	0.2	3.7	138.1
172 Joutsa	37.9	15.3	20.7	70.9	33.6	34.1	22.3	4.3	14.9	9.2	0.4	5.9	140.3
179 Jyväskylä	40.7	15.7	22.8	65.4	31.9	30.7	18.4	3.4	12.2	7.5	0.3	4.8	132.0
180 Jyväskylän mlk	44.3	17.5	24.5	66.1	32.3	31.0	17.4	3.4	11.4	5.8	0.3	3.7	133.5
182 Jämsä	45.3	18.5	24.6	70.9	34.5	33.0	18.2	3.0	12.6	4.7	0.3	3.0	139.0
183 Jämsänkoski	46.8	17.6	26.7	55.4	26.3	26.4	15.2	2.5	10.1	4.7	0.2	2.9	122.1
216 Kannonkoski	54.4	16.9	34.2	38.1	16.7	19.3	13.7	1.5	9.5	2.7	0.1	1.6	108.9
226 Karstula	53.3	14.1	35.4	25.9	11.3	13.1	12.4	1.0	8.7	2.1	0.1	1.2	93.7

249	Keuruu	51.8	18.3	30.6	41.7	19.9	19.6	12.7	1.3	8.8	2.0	0.0	1.2	108.3
256	Kinnula	47.6	11.9	32.0	19.5	7.7	10.3	11.9	0.8	8.6	2.0	0.1	1.1	81.0
265	Kivijärvi	54.0	15.6	34.8	27.8	12.0	14.1	11.6	1.0	8.2	2.1	0.1	1.2	95.6
275	Konnevesi	43.5	17.6	23.7	62.9	30.5	29.7	16.7	3.1	11.2	5.0	0.2	3.0	128.0
277	Korpilahti	42.2	16.8	23.4	66.8	32.3	31.7	17.4	3.2	11.5	6.4	0.3	4.1	132.9
291	Kuhmoinen	44.9	18.7	24.0	69.8	34.9	31.8	15.4	3.0	10.0	6.0	0.4	3.9	136.0
312	Kyyjärvi	49.8	12.1	33.7	14.8	5.7	8.1	9.8	0.6	7.0	1.4	0.1	0.8	75.9
410	Laukaa	45.6	18.4	24.9	63.8	31.0	30.1	16.7	3.2	11.1	5.5	0.3	3.4	131.5
415	Leivonmäki	48.0	17.6	27.9	59.8	27.6	29.5	17.0	3.2	11.1	4.6	0.3	3.0	129.5
435	Luhanka	40.1	15.7	22.3	64.0	30.1	30.8	20.5	3.8	13.7	8.3	0.4	5.3	132.7
495	Multia	52.7	15.5	33.9	34.0	15.6	16.6	12.9	1.4	8.8	2.1	0.1	1.2	101.6
500	Muurame	40.0	15.8	22.1	66.0	31.9	31.2	17.1	3.0	11.3	6.7	0.3	4.2	129.8
592	Pelätjärvi	47.7	16.7	28.3	51.9	24.6	24.8	14.9	2.5	9.8	4.2	0.2	2.7	118.7
601	Pihtipudas	49.7	13.5	32.6	31.2	13.2	15.9	13.7	1.2	9.8	2.8	0.1	1.6	97.5
633	Pylkönmäki	52.2	15.1	33.8	29.9	13.4	14.7	12.9	1.2	8.9	2.1	0.1	1.2	97.1
729	Saarijärvi	51.5	17.7	30.9	46.6	21.8	22.6	15.1	2.1	10.3	3.3	0.2	2.0	116.6
850	Toivakka	45.3	18.2	24.9	62.0	29.2	30.0	18.4	3.6	12.2	5.9	0.3	3.8	131.7
892	Uurainen	51.1	18.0	30.2	50.6	24.2	24.1	14.2	2.5	9.3	3.7	0.2	2.3	119.7
931	Vitasaari	45.8	15.6	27.5	46.8	21.1	23.2	15.4	2.0	10.7	4.2	0.2	2.5	112.1
992	Äänekoski	51.2	19.1	29.2	53.7	24.4	26.7	15.9	2.7	10.7	4.3	0.2	2.6	125.0
Total														
	Multi-source inventory	48.0	16.6	28.6	49.1	23.1	23.6	15.2	2.2	10.3	4.0	0.2	2.5	116.4
	Field inventory	48.6			48.1			15.9			4.1			116.8
	SE of field inventory	1.0			1.5			0.5			0.3			1.8
<b>Pohjois-Savo Municipality</b>														
140	Iisalmi	31.8	9.5	20.3	55.8	26.5	26.5	17.6	1.6	12.7	5.4	0.2	3.1	110.5
174	Juankoski	36.3	14.0	20.4	62.6	32.8	27.1	16.9	2.3	11.9	7.0	0.2	4.3	122.7
204	Kaavi	45.6	18.7	24.6	58.4	30.8	25.0	15.7	2.4	11.0	5.6	0.1	3.5	125.3

(continued)

Table 6a (continued)

	Pine						Spruce						Birch						Other deciduous tree species					
	Total		Logs		Pulpwood		Total		Logs		Pulpwood		Total		Logs		Pulpwood		Total		Logs		Pulpwood	
	(m <sup>3</sup> /ha)																							
227	37.4	14.9	20.4	61.7	31.1	27.7	19.6	3.2	13.6	7.2	0.3	4.6	125.8											
239	44.3	14.5	27.1	45.6	21.3	21.9	16.9	1.9	12.1	4.0	0.2	2.5	110.9											
263	36.2	9.0	24.5	35.4	14.6	18.3	18.3	1.1	13.3	3.9	0.2	2.4	93.8											
297	36.6	16.3	18.6	71.5	37.9	30.5	19.2	3.4	13.2	8.2	0.3	5.2	135.4											
402	33.8	10.4	21.4	59.4	29.3	27.1	18.2	1.8	13.1	5.5	0.2	3.3	116.8											
420	39.0	18.1	19.1	77.4	41.8	32.3	20.2	4.0	13.8	7.9	0.3	5.1	144.4											
476	33.6	12.1	19.7	72.5	36.8	32.4	17.9	2.4	12.8	6.7	0.3	4.2	130.7											
534	33.2	11.5	19.9	64.4	33.4	28.1	17.9	2.1	12.8	6.9	0.2	4.2	122.4											
595	38.7	12.0	24.2	51.1	23.8	24.6	17.4	1.8	12.4	5.0	0.2	3.0	112.1											
686	42.4	17.4	22.8	56.3	26.9	26.7	18.4	3.3	12.6	6.3	0.2	3.9	123.3											
687	41.2	10.6	27.8	33.1	13.9	16.9	16.3	1.1	11.8	3.4	0.1	2.1	93.9											
749	30.6	12.0	17.1	66.4	34.3	29.1	17.2	2.5	12.1	7.5	0.3	4.7	121.8											
762	37.8	9.2	25.8	33.0	13.7	17.1	16.5	1.0	12.0	3.0	0.1	1.8	90.3											
778	43.1	18.7	22.2	66.1	33.9	29.4	17.7	3.3	12.2	5.7	0.2	3.6	132.7											
844	38.3	14.7	21.5	59.2	28.7	27.6	17.7	2.8	12.3	6.6	0.3	4.1	121.7											
857	35.2	15.5	17.9	62.1	32.9	26.3	17.8	3.2	12.2	7.5	0.2	4.6	122.5											
915	49.6	21.1	26.5	63.7	32.2	28.5	18.0	4.1	11.6	6.3	0.4	3.4	137.6											
916	34.5	10.8	21.7	55.4	27.1	25.5	18.0	1.7	12.9	5.4	0.2	3.2	113.2											
921	41.9	15.5	24.0	54.8	25.7	26.4	17.2	2.8	11.8	5.0	0.2	3.1	118.8											
925	37.5	9.6	25.2	33.5	13.6	17.5	17.7	1.1	12.8	3.2	0.1	1.9	91.9											
Total	38.2	13.2	22.7	53.7	26.3	24.7	17.8	2.2	12.5	5.5	0.2	3.4	115.1											
Multi-source inventory	36.9			52.2			18.7			6.7			114.5											
SE of field inventory	1.0			1.5			0.6			0.4			1.7											



<b>Pohjois-Karjala</b>														
<i>Municipality</i>														
45	Eno	46.8	16.1	28.0	34.3	15.4	16.8	16.7	2.6	11.7	2.8	0.1	1.3	100.6
146	Ilomantsi	57.9	15.4	38.3	18.4	7.2	9.9	10.4	0.8	6.9	1.7	0.0	0.8	88.4
167	Joensuu	48.7	15.9	30.5	44.4	19.6	22.7	17.0	2.5	11.6	3.2	0.1	1.5	113.3
176	Juuka	51.5	14.2	34.4	31.6	14.1	15.6	13.5	1.3	9.4	3.6	0.1	1.9	100.3
248	Kesälahti	69.3	26.9	38.7	24.8	9.1	14.1	17.4	2.4	12.0	5.2	0.1	2.8	116.7
260	Kitee	56.7	20.8	32.9	40.7	17.6	20.6	19.1	2.8	12.8	4.4	0.1	1.7	120.8
276	Kontiolahdi	64.3	27.0	34.3	29.6	13.1	14.8	18.5	1.7	13.6	3.9	0.1	2.0	116.4
309	Outokumpu	60.6	23.9	34.0	38.9	14.7	21.7	21.0	2.2	15.9	8.3	0.1	4.6	128.9
422	Lieksa	58.9	17.2	38.1	20.3	8.4	10.4	12.5	1.1	8.4	2.2	0.1	1.2	93.9
426	Liperi	55.9	19.8	33.6	40.9	17.0	21.3	18.8	3.0	13.0	5.8	0.4	3.5	121.4
541	Nurmes	41.6	11.0	27.7	29.8	12.2	15.7	14.6	1.3	10.0	3.3	0.1	1.8	89.3
607	Polvijärvi	56.0	16.0	37.5	31.7	12.8	16.8	18.6	2.0	13.5	6.7	0.1	3.9	113.0
632	Pyhäselkä	36.9	14.1	21.3	53.9	23.5	27.7	22.6	3.3	15.8	6.0	0.0	3.9	119.3
707	Rääkkylä	54.3	20.4	32.0	42.5	20.0	20.6	25.6	3.3	18.1	5.7	0.2	3.2	128.1
848	Tohmajärvi	55.8	18.6	34.7	40.1	18.7	19.3	13.5	2.1	8.6	3.4	0.1	1.7	112.8
911	Valtimo	37.9	9.1	26.2	26.5	10.1	14.7	14.2	1.3	9.7	3.5	0.0	1.8	82.2
Total														
	Multi-source inventory	53.8	16.6	34.0	29.6	12.5	15.2	14.9	1.7	10.3	3.4	0.1	1.8	101.7
	Field inventory	51.8			30.6			15.7			3.9			102.0
	SE of field inventory	1.1			1.1			0.5			0.3			1.4
<b>Kainuu</b>														
<i>Municipality</i>														
105	Hyrnsalmi	42.3	11.2	28.1	19.3	6.6	11.2	11.1	0.3	7.7	1.1	0.1	0.6	73.8
205	Kajaani	50.3	10.7	35.7	9.0	2.6	5.4	14.5	0.2	10.3	1.7	0.1	1.1	75.5

(continued)

Table 6a (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Total		Logs	Pulpwood		Logs	Pulpwood		Logs	Total		Pulpwood	
	Logs	Pulpwood		Logs	Pulpwood		Logs	Pulpwood		Logs	Pulpwood		
	(m <sup>3</sup> /ha)												
290 Kuhmo	51.6	15.8	32.2	16.4	5.0	10.0	9.7	0.2	6.3	1.1	0.0	0.6	78.7
578 Paltamo	44.9	11.0	31.2	21.0	7.2	12.3	15.1	0.4	10.9	1.8	0.1	1.0	82.8
620 Puolanka	37.5	9.4	25.2	18.8	6.3	11.2	10.0	0.3	7.1	1.0	0.0	0.6	67.3
697 Ristijärvi	39.3	10.4	26.3	23.9	8.1	14.0	13.8	0.4	9.9	1.5	0.0	0.8	78.6
765 Sotkamo	44.9	10.4	31.5	21.2	7.0	12.4	13.9	0.4	9.6	1.9	0.1	1.1	81.8
777 Suomussalmi	42.2	12.1	26.9	15.4	4.6	9.6	8.0	0.2	5.5	0.8	0.0	0.5	66.4
785 Vaala	49.8	11.3	34.1	3.4	1.1	1.9	11.2	0.2	7.8	1.1	0.1	0.8	65.4
Total													
Multi-source inventory	45.2	12.1	29.9	16.4	5.2	9.8	10.8	0.3	7.5	1.2	0.0	0.7	73.6
Field inventory	44.3			17.2			11.4			1.3			74.2
SE of field inventory	0.9			0.8			0.3			0.1			1.2
<b>Pohjois-Pohjanmaa</b>													
<i>Municipality</i>													
9 Alavieska	50.5	10.0	36.6	16.7	5.3	10.0	14.4	0.3	10.6	2.5	0.1	1.5	84.0
69 Haapajärvi	50.3	11.8	34.8	21.0	7.0	12.4	18.3	0.7	13.7	3.8	0.1	2.6	93.5
71 Haapavesi	45.8	10.7	31.8	16.2	4.3	10.4	24.5	0.5	18.9	4.4	0.1	3.3	91.0
72 Hailuoto	48.6	11.5	32.5	5.7	1.7	3.6	14.7	0.1	10.0	2.8	0.1	2.0	71.7
84 Haukipudas	43.5	9.1	30.6	15.2	4.2	9.7	15.2	0.2	11.3	2.1	0.1	1.4	75.9
139 Ii	38.5	7.7	27.3	13.0	3.0	8.8	18.9	0.2	14.2	2.6	0.2	1.8	73.0
208 Kalajoki	47.1	8.0	35.2	11.0	2.4	7.3	14.9	0.3	11.0	1.5	0.1	0.8	74.5
244 Kempele	42.2	8.3	29.6	8.2	2.1	5.4	16.6	0.1	11.6	2.6	0.1	2.0	69.5
247 Kestliä	50.2	9.1	36.4	4.2	1.0	2.7	15.9	0.2	11.2	1.7	0.1	1.2	71.9
255 Kiiminki	49.5	9.6	35.7	15.9	4.1	10.4	13.0	0.2	9.4	1.4	0.1	0.9	79.8

305	Kuusamo	36.6	9.5	24.5	16.3	4.6	10.4	6.8	0.1	4.9	1.1	0.0	0.6	60.8
317	Kärämäki	48.8	10.1	35.1	13.6	3.7	8.7	22.0	0.5	16.1	4.9	0.2	3.7	89.3
425	Liminka	40.3	5.5	29.9	3.1	0.9	2.0	17.0	0.1	11.6	2.0	0.1	1.5	62.4
436	Lumijoki	41.7	7.8	30.0	7.2	1.9	4.8	22.4	0.1	15.4	3.5	0.2	2.8	74.8
483	Merijärvi	48.6	9.5	35.8	22.1	6.7	13.6	18.9	0.3	14.9	3.5	0.1	2.4	93.1
494	Muhos	46.5	9.5	32.3	5.3	1.4	3.4	11.9	0.1	8.4	1.4	0.1	1.0	65.0
535	Nivala	47.4	12.1	32.2	25.8	9.1	15.0	18.0	0.5	14.0	3.7	0.1	2.6	94.9
563	Oulainen	41.5	9.3	29.3	21.4	7.1	12.7	19.5	0.3	15.5	3.9	0.1	3.0	86.3
564	Oulu	52.1	11.5	36.6	16.6	4.3	10.8	16.6	0.2	12.4	2.6	0.2	1.8	87.9
567	Oulunsalo	46.4	9.1	32.8	11.6	2.7	7.9	15.2	0.1	11.1	2.2	0.1	1.6	75.5
603	Piippola	50.5	9.2	37.1	7.4	1.7	4.8	19.6	0.2	14.3	2.7	0.2	2.0	80.2
615	Pudasjärvi	39.9	6.5	29.6	10.8	2.7	7.1	8.2	0.1	5.8	0.9	0.0	0.5	59.8
617	Pulkila	53.5	9.8	39.4	9.9	2.6	6.3	21.0	0.3	15.4	3.1	0.2	2.3	87.5
625	Pyhäjoki	42.4	7.6	31.4	14.3	3.5	9.3	20.4	0.3	15.7	3.4	0.2	2.1	80.5
626	Pyhäsalmi	46.8	9.4	34.2	17.6	5.4	10.7	18.7	0.5	13.8	2.7	0.1	1.7	85.7
630	Pyhäntä	53.7	10.5	38.8	5.6	1.4	3.6	14.6	0.2	10.3	1.7	0.1	1.2	75.6
678	Raabe	45.3	9.6	31.8	15.7	4.6	9.8	20.5	0.3	15.6	4.3	0.4	2.9	85.7
682	Rantsila	47.5	7.6	35.0	5.6	1.4	3.6	16.8	0.2	12.0	2.0	0.1	1.4	71.9
691	Reisjärvi	54.7	10.7	39.3	11.6	4.3	6.3	13.0	0.6	9.1	2.6	0.1	1.3	81.8
746	Stievi	50.4	10.6	35.6	9.1	3.2	5.2	12.6	0.4	9.0	1.8	0.1	1.0	74.0
748	Siikajoki	45.5	8.2	32.7	7.8	2.0	5.1	17.7	0.1	12.6	2.6	0.1	2.0	73.5
832	Taivalkoski	36.9	8.2	26.0	18.7	5.3	12.1	8.3	0.1	5.7	1.2	0.0	0.8	65.2
859	Tymävä	43.3	6.2	31.9	2.7	0.7	1.8	14.1	0.1	9.7	1.3	0.1	1.0	61.4
889	Utajärvi	50.5	9.5	35.9	4.8	1.1	3.1	10.2	0.2	7.4	1.0	0.1	0.8	66.5
926	Vihanti	46.8	8.9	33.6	11.6	3.3	7.3	17.7	0.2	13.3	2.9	0.2	2.0	79.0
972	Yli-Ii	42.1	7.3	30.5	8.9	1.6	6.2	12.6	0.1	9.0	1.2	0.1	0.8	64.8

(continued)

Table 6a (continued)

	Pine		Spruce		Birch		Other deciduous tree species		All tree species					
	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs		Pulpwood				
	(m <sup>3</sup> /ha)													
973	Ylikiiminki	50.5	9.2	36.3	10.1	2.3	6.8	12.7	0.1	9.3	1.3	0.1	1.0	74.6
977	Ylivieska	44.1	9.3	31.4	18.3	6.4	10.7	16.8	0.3	12.9	3.2	0.1	2.2	82.4
	Total	43.5	8.7	31.0	12.7	3.5	8.1	13.2	0.2	9.6	1.9	0.1	1.3	71.3
	Multi-source inventory													
	Field inventory	42.6			14.1			13.7			2.1			72.5
	SE of field inventory	0.7			0.6			0.3			0.1			1.0
<b>Lapland</b>														
<i>Municipality</i>														
47	Enontekiö	17.9	3.2	13.8	1.5	0.3	1.0	12.2	0.0	3.8	0.1	0.0	0.0	31.7
148	Inari	39.6	6.3	31.1	2.7	0.7	1.9	6.5	0.0	3.0	0.1	0.0	0.0	48.9
240	Kemi	15.6	1.6	12.3	28.2	9.6	16.5	22.3	0.2	16.4	2.8	0.0	1.6	68.7
241	Keminmaa	18.2	2.7	13.6	25.1	6.7	16.0	23.2	0.3	16.9	2.0	0.0	1.2	68.4
261	Kittilä	25.6	4.9	18.7	10.0	1.9	7.1	9.4	0.1	6.6	0.4	0.0	0.2	45.4
320	Kolari	34.3	7.3	23.9	9.2	1.1	6.7	9.0	0.1	6.1	0.6	0.0	0.3	53.1
373	Kemijärvi	38.1	6.9	27.7	6.9	1.1	5.0	6.7	0.0	4.4	0.4	0.0	0.1	52.0
498	Muonio	40.9	11.0	27.7	8.5	1.9	5.8	6.5	0.0	3.9	0.3	0.0	0.2	56.2
583	Pelkosenniemi	30.4	4.8	22.7	8.8	1.3	6.3	9.7	0.0	6.2	0.7	0.0	0.4	49.6
614	Posio	37.9	7.7	27.3	11.4	2.7	7.8	5.4	0.0	3.8	0.6	0.0	0.3	55.2
683	Ranua	30.0	4.1	22.4	7.0	0.8	5.2	6.4	0.0	4.1	0.4	0.0	0.2	43.8
698	Rovaniemi	34.8	6.1	25.3	9.7	1.1	7.2	7.4	0.1	5.1	0.5	0.0	0.3	52.3
732	Salla	29.7	5.4	22.0	14.3	3.5	9.5	7.7	0.1	5.3	0.8	0.0	0.4	52.4
742	Savukoski	34.6	6.4	25.6	10.5	2.6	7.0	5.6	0.0	3.9	0.3	0.0	0.1	50.9

751	Simo	29.0	5.6	19.7	12.0	2.2	8.4	18.4	0.2	13.2	1.1	0.0	0.7	60.6
758	Sodankylä	29.5	5.8	21.7	9.0	2.0	6.3	7.4	0.0	5.0	0.2	0.0	0.1	46.1
845	Tervola	23.8	3.0	18.0	20.0	3.3	14.2	14.9	0.1	10.4	1.2	0.0	0.8	59.9
851	Tomio	16.5	1.9	12.7	25.2	5.9	16.9	21.3	0.3	15.3	2.0	0.0	1.2	65.0
854	Pello	32.4	6.3	22.7	11.0	1.3	8.0	10.2	0.1	6.9	0.9	0.0	0.5	54.5
890	Utsjoki	3.0	0.1	2.5	0.3	0.0	0.2	12.1	0.0	2.4	0.1	0.0	0.0	15.4
976	Ylitornio	30.0	5.0	21.0	10.9	1.2	8.0	12.8	0.1	8.7	0.7	0.0	0.5	54.4
Total														
	Multi-source inventory	31.7	5.7	23.5	8.8	1.7	6.2	8.4	0.1	5.2	0.4	0.0	0.2	49.3
	Field inventory	31.7			9.7			8.8			0.5			50.6
	SE of field inventory	0.7			0.4			0.2			0.0			0.7

**Table 6b.** The growing stock volume by tree species and roundwood assortment on forest land and poorly productive forest land (By forestry centres).

	Pine						Spruce						Birch						Other deciduous tree species					
	Total		Logs		Pulpwood		Total		Logs		Pulpwood		Total		Logs		Pulpwood		Total		Logs		Pulpwood	
	(1,000m <sup>3</sup> )																							
<b>Åland</b>																								
<i>Municipality</i>																								
35 Brändö	158	4	144	5	1	4	83	0	71	96	1	56	341											
43 Eckerö	509	57	433	224	56	148	101	3	82	50	1	40	884											
60 Finström	512	60	435	258	66	171	119	4	97	73	1	58	962											
62 Föglö	593	64	507	198	50	132	93	2	75	91	2	60	976											
65 Geta	338	32	292	126	30	85	50	2	41	26	0	20	540											
76 Hammarland	596	66	509	276	68	185	136	4	112	79	2	63	1,087											
170 Jomala	623	78	526	323	82	215	141	5	115	90	2	71	1,177											
295 Kumlinge	267	23	232	45	9	33	67	1	55	75	2	50	454											
318 Kökar	55	7	44	9	1	8	34	0	25	42	1	26	140											
417 Lemland	503	59	426	260	67	172	132	4	108	85	3	67	979											
438 Lumparland	172	19	147	67	16	45	25	1	20	18	0	13	282											
478 Mariehamn	34	3	30	12	3	8	8	0	6	6	0	4	60											
736 Saltvik	656	69	563	267	66	180	97	3	79	56	1	42	1,076											
766 Sottunga	57	5	49	14	3	10	17	0	13	19	0	12	107											
771 Sund	485	53	415	205	49	139	89	3	72	56	2	43	836											
941 Vårdö	387	38	334	132	31	89	56	1	45	40	1	28	615											
<b>Total</b>	5,945	637	05,088	02,422	599	1,623	1,248	33	1,016	901	19	652	10,516											
Multi-source inventory																							982	
Field inventory																							136	
SE of field inventory																							545	
<b>Rannikko/Etelärannikko</b>																								
<i>Municipality</i>																								
40 Dragsfjärd	1,371	418	889	674	265	377	183	31	130	79	9	44	2,307											
49 Espoo-Esbo	789	345	418	1,089	557	475	441	130	269	241	42	147	2,560											
78 Hanko-Hangö	593	172	405	215	65	136	154	24	114	49	16	28	1,011											
91 Helsinki-Helsingfors	223	86	128	323	150	152	229	60	137	128	17	80	903											
92 Vantaa-Vanda	335	131	189	721	327	351	355	93	218	187	21	126	1,599											

101	Houtskär-Houtskari	689	172	485	212	75	127	41	6	26	31	8	22	973
149	Ingå-Inkoo	1,220	485	693	1,341	655	619	432	130	265	128	48	61	3,120
150	Iniö	418	135	267	118	40	71	25	3	18	25	7	17	586
220	Karis-Karjaa	633	228	382	722	325	359	298	79	194	97	28	52	1,749
235	Kauniainen-Grankulla	11	4	6	12	6	5	6	2	4	3	0	2	32
243	Kimito-Kemio	1,424	535	832	798	349	410	216	41	143	77	13	46	2,516
257	Kirkkonummi-Kyrkslätt	1,140	481	622	1,325	700	559	495	145	305	226	57	121	3,187
279	Korpo-Korpoo	811	199	574	252	93	146	66	9	47	41	5	30	1,170
407	Lapinjärvi-Lappträsk	678	260	389	1,538	656	801	402	75	282	88	13	54	2,706
424	Liljendal	241	90	140	485	206	254	124	23	86	29	5	18	879
434	Loviisa-Lovisa	167	61	99	198	84	103	60	11	45	14	1	10	439
533	Nagu-Nauvo	1,240	301	875	417	142	254	183	20	144	63	2	44	1,903
573	Pargas-Parainen	1,138	377	708	492	192	273	205	34	144	89	9	54	1,925
585	Pernå-Pernaja	1,252	412	783	1,874	789	982	582	97	426	150	23	102	3,858
606	Pohja-Pojo	1,043	340	664	706	280	384	233	48	153	74	16	48	2,056
638	Porvoo-Borgå	1,787	554	1,165	2,858	1,191	1,502	835	161	572	300	38	223	5,781
701	Ruotsinpyhäät-Strömfors	782	259	490	1,080	417	599	417	73	313	96	12	68	2,375
753	Sipoo-Sibbo	917	330	555	1,617	722	801	551	131	353	219	25	161	3,304
755	Siuntio-Sjundeå	640	303	316	1,116	600	463	293	79	186	143	44	69	2,192
835	Ekenäs-Tammisaari	3,427	1,048	2,260	2,025	808	1,111	711	133	479	246	57	156	6,410
923	Västankjär	485	173	294	261	112	136	73	15	48	21	4	13	840
Total														
	Multi-source inventory	23,454	7,898	14,627	22,470	9,806	11,450	7,611	1,657	5,100	2,844	522	1,797	56,378
	Field inventory	22,231			21,751			8,242			3,751			55,975
	SE of field inventory	1,089			1,316			537			348			2,092
<b>Rannikko/Pohjanmaa</b>														
<i>Municipality</i>														
231	Kaskinen-Kaskö	18	4	13	37	11	23	12	1	9	4	0	3	72
272	Kokkola-Karleby	946	207	674	712	217	452	453	22	354	66	5	44	2,177
280	Korsnäs	535	149	345	796	243	496	449	34	335	46	3	30	1,827
287	Kristinestad- Kristinankaupunki	1,906	562	1,216	2,671	826	1,693	860	70	657	161	22	110	5,599
288	Kronoby-Kruunupy	2,689	612	1,879	1,437	471	886	847	38	652	83	5	60	5,056

(continued)





214	Kankaanpää	2,693	834	1,705	1,614	753	762	729	71	539	125	10	86	5,161
230	Karvia	2,034	566	1,360	476	173	270	441	25	328	67	9	47	3,018
252	Kiikala	943	437	475	962	468	449	223	37	147	78	12	54	2,206
254	Kiikoinen	478	168	284	584	278	273	170	23	124	31	2	21	1,263
259	Kisko	1,167	540	587	1,078	507	516	269	47	175	106	19	72	2,620
262	Kiukainen	397	156	224	436	181	228	138	15	97	32	4	22	1,003
271	Kokemäki	1,758	627	1,047	1,691	742	845	533	65	373	89	11	60	4,070
284	Koski Tl	404	170	220	722	370	317	159	19	112	33	3	22	1,319
304	Kustavi	912	342	538	281	89	171	105	20	71	104	20	71	1,402
308	Kuusjoki	287	133	145	377	182	177	80	12	54	27	4	19	771
319	Köyliö	971	374	556	809	370	392	264	32	186	51	7	36	2,095
400	Laitila	2,366	948	1,325	1,734	744	885	495	49	340	132	18	92	4,728
406	Lappi	957	378	538	705	309	353	196	21	137	52	7	36	1,910
413	Lavia	1,260	459	732	1,264	560	624	448	58	328	83	6	59	3,056
419	Lemu	131	53	73	72	30	38	20	2	14	9	1	7	232
423	Lieto	674	309	343	519	243	250	109	16	72	50	8	36	1,352
430	Loimaa	920	386	501	1,623	837	709	345	40	244	75	8	48	2,962
442	Luvia	716	283	395	948	409	476	300	24	222	44	7	31	2,007
480	Marttila	549	236	292	631	300	298	160	22	108	49	7	35	1,389
481	Masku	305	121	171	206	87	107	55	6	38	26	3	18	591
482	Mellilä	190	69	112	274	138	121	72	8	50	13	1	9	549
484	Merikarvia	1,844	572	1,135	1,538	624	808	581	63	420	117	9	83	4,079
485	Merimasku	270	109	151	94	33	54	29	5	20	25	4	18	418
501	Muurila	311	145	155	250	116	121	64	11	41	26	4	18	650
503	Mynämäki	2,027	780	1,157	1,608	716	794	513	58	359	135	18	95	4,283
529	Naantali	224	89	127	88	33	49	24	4	17	17	2	12	353
531	Nakkila	448	163	264	622	269	312	213	21	156	33	5	22	1,316
537	Noormarkku	1,254	492	700	1,671	769	805	505	62	369	75	9	52	3,505
538	Nousiainen	782	329	425	678	326	316	155	21	108	38	5	25	1,652
561	Oripää	392	161	216	279	129	135	91	12	62	23	3	17	785
577	Paimio	915	389	495	557	247	287	138	25	91	63	7	43	1,673
586	Perniö	1,820	840	919	1,403	658	680	341	64	216	131	22	92	3,694
587	Pertteli	463	218	230	428	201	207	100	16	65	42	8	29	1,033
602	Piikkiö	308	127	170	187	83	96	43	8	29	24	3	16	562

(continued)



**Häme-Uusimaa***Municipality*

15	Artjärvi	383	183	182	785	377	362	162	38	102	62	5	41	1,391
16	Asikkala	1,812	979	772	3,561	1,865	1,534	1,016	253	649	405	52	263	6,793
18	Askola	512	269	227	1,160	548	554	270	74	167	78	12	47	2,021
61	Forssa	580	261	299	1,265	660	542	267	45	185	33	6	23	2,146
81	Hartola	1,813	899	862	3,344	1,576	1,616	1,289	289	875	415	48	243	6,861
82	Hattula	1,126	473	609	1,819	872	842	679	144	456	76	14	48	3,699
83	Hauho	974	492	458	2,690	1,464	1,116	474	92	331	214	28	162	4,352
86	Hausjärvi	838	359	444	1,855	1,008	769	372	79	245	125	23	70	3,189
98	Hollola	1,048	543	461	2,692	1,429	1,137	466	86	310	241	33	152	4,448
103	Humpilla	280	121	150	744	371	344	164	22	123	17	2	12	1,204
106	Hyvinkää	859	347	471	1,676	903	702	388	84	255	127	20	76	3,051
109	Hämeenlinna	434	194	224	872	441	387	274	57	186	67	9	47	1,647
111	Heinola	3,228	1,617	1,478	3,227	1,475	1,598	1,349	325	861	410	40	248	8,214
165	Janakkala	1,321	598	677	3,218	1,741	1,337	719	135	498	198	35	129	5,455
169	Jokioinen	379	175	193	787	407	343	152	24	107	24	3	17	1,341
186	Järvenpää	39	17	20	121	61	54	32	6	21	18	2	9	210
210	Kalvola	925	367	519	1,780	853	831	550	98	385	38	5	26	3,293
223	Karjalohja	404	164	223	484	253	211	140	24	92	25	4	16	1,053
224	Karkkila	721	317	376	1,472	797	608	347	75	235	97	13	67	2,637
245	Kerava	45	21	21	121	54	60	37	8	24	18	1	11	221
283	Hämeenkoski	350	166	169	1,213	636	521	207	33	147	76	12	49	1,847
316	Kärkölä	453	194	236	1,371	736	578	260	54	172	87	10	52	2,170
398	Lahti	281	150	121	549	278	240	127	24	78	113	13	72	1,070
401	Lammi	1,339	635	653	3,742	1,984	1,575	668	101	485	224	33	150	5,973
433	Loppi	1,804	771	960	3,721	2,014	1,543	884	190	591	192	28	133	6,602
444	Lohja-Lojo	780	361	394	1,251	686	510	340	65	231	134	19	79	2,504
504	Myrskylä-Mörskom	535	261	254	1,066	491	514	270	67	171	69	10	40	1,940
505	Mäntsälä	1,237	539	645	3,674	1,996	1,531	616	147	394	195	27	111	5,722
532	Nastola	1,078	572	470	1,395	688	639	400	90	244	242	30	150	3,115
540	Nummi-Pusula	1,417	600	763	2,186	1,105	973	599	112	412	132	19	90	4,334
543	Nurmijärvi	668	269	364	1,555	808	676	395	86	260	199	28	126	2,817

(continued)

Table 6b (continued)

	Pine						Spruce						Birch						Other deciduous tree species									
	Pulpwood		Total		Logs		Pulpwood		Total		Logs		Pulpwood		Total		Logs		Pulpwood		Total		Logs		Pulpwood			
	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood		
	(1,000 m <sup>3</sup> )																											
560	1,314	653	604	2,795	1,458	1,194	530	115	332	238	29	145	4,877															
576	2,004	1,094	844	4,037	2,266	1,582	952	196	660	276	41	183	7,269															
611	319	161	146	744	341	365	197	44	125	70	11	39	1,330															
616	249	120	119	658	336	291	151	33	98	54	7	31	1,113															
692	943	430	479	1,638	899	668	407	99	262	51	9	33	3,039															
694	252	106	135	634	352	256	141	30	93	54	11	33	1,082															
737	230	96	125	277	141	123	86	15	58	17	3	10	609															
781	2,444	1,273	1,095	3,895	1,856	1,854	1,554	370	1,045	553	68	355	8,446															
834	2,163	893	1,190	3,441	1,758	1,498	907	157	637	107	11	80	6,619															
855	398	190	195	1,159	620	486	202	33	144	66	9	46	1,824															
858	356	148	189	987	498	445	240	49	156	115	15	70	1,699															
927	1,474	632	781	2,696	1,419	1,145	743	168	499	363	51	245	5,276															
981	376	179	187	799	397	366	165	26	116	26	3	19	1,365															
Total	40,184	18,886	19,784	79,157	40,921	34,520	20,185	4,259	13,516	6,341	854	4,048	145,867															
Multi-source inventory	38,692			79,011			20,689			7,920			146,312															
Field inventory	1,413			2,287			745			503			3,160															
SE of field inventory																												
<b>Kaakkois-Suomi</b>																												
<i>Municipality</i>																												
44	802	326	442	1,647	785	783	352	66	237	109	14	72	2,910															
75	2,667	873	1,662	2,619	1,134	1,349	576	97	394	150	16	98	6,012															
142	1,755	634	1,035	2,739	1,268	1,327	749	134	502	236	27	154	5,478															
153	525	244	262	608	274	307	227	50	150	76	11	41	1,436															
163	2,612	1,107	1,384	1,618	678	848	820	142	578	213	18	148	5,263															
173	1,178	568	569	1,267	592	617	500	113	331	178	27	98	3,123															
285	1,003	379	574	992	437	499	355	63	249	102	8	69	2,452															
286	95	28	62	108	45	56	39	6	26	13	1	8	254															
306	329	105	207	423	184	216	137	22	93	42	4	27	931															

405	Lappeenranta	3,097	1,189	1,752	3,625	1,810	1,654	908	178	624	262	37	162	7,892
416	Lenni	1,017	456	520	997	502	449	349	77	233	108	14	67	2,470
441	Luumäki	3,730	1,238	2,293	3,586	1,640	1,768	881	162	607	192	23	130	8,390
489	Miehikkälä	1,920	571	1,233	1,824	783	941	355	53	250	78	10	51	4,178
580	Parikkala	2,280	994	1,184	1,734	689	941	828	145	557	339	18	193	5,181
624	Pyhtää-Pyhtis	1,050	410	587	1,265	564	630	480	99	326	132	13	88	2,927
689	Rautjärvi	1,630	759	812	1,554	725	748	643	133	430	223	23	126	4,050
700	Ruokolahti	5,729	2,387	3,074	3,594	1,634	1,762	1,572	350	1,034	346	34	193	11,239
739	Savitaipale	3,312	1,340	1,814	1,937	889	951	911	208	599	168	11	114	6,329
754	Anjalankoski	2,726	883	1,700	2,952	1,259	1,536	710	122	484	177	23	115	6,565
775	Suomenniemi	2,011	912	1,007	775	329	401	489	119	318	92	6	56	3,368
831	Taipalsaari	2,156	1,010	1,060	1,135	508	565	670	153	441	180	24	103	4,140
909	Valkeala	4,374	1,572	2,577	3,332	1,445	1,708	1,061	187	723	261	24	176	9,028
935	Virolahti	1,610	505	1,006	1,294	544	676	269	41	184	60	6	39	3,233
978	Ylämaa	1,802	533	1,152	1,786	780	907	388	57	279	79	10	53	4,056
Total														
	Multi-source inventory	49,410	19,023	27,968	43,413	19,497	21,638	14,267	2,779	9,649	3,816	400	2,382	110,906
	Field inventory	48,781			44,535			13,960			4,704			111,981
	SE of field inventory	1,468			1,726			621			336			2,499
<b>Pirkkanmaa</b>														
<i>Municipality</i>														
20	Akaa	199	77	113	372	163	185	131	17	95	24	3	17	726
108	Hämeenkyrö	1,224	489	676	2,394	1,071	1,182	763	87	569	144	24	95	4,524
143	Ikaalinen	2,876	1,058	1,672	3,070	1,420	1,467	1,007	110	740	135	15	92	7,088
177	Juupajoki	874	367	469	1,557	753	721	412	55	301	61	8	41	2,903
211	Kangasala	1,424	600	761	2,583	1,167	1,258	826	113	598	178	20	125	5,011
250	Kihniö	1,765	499	1,167	630	244	339	497	36	376	59	6	43	2,952
289	Kuhmalhti	506	214	272	1,088	503	522	327	49	235	73	8	51	1,993
303	Kuru	3,547	1,256	2,121	3,193	1,433	1,568	1,044	107	770	115	13	77	7,899
310	Kylmäkoski	525	211	292	906	430	424	242	34	175	36	4	24	1,708
418	Lempäälä	651	285	338	1,674	764	814	451	56	333	94	14	64	2,870
493	Mouhujärvi	749	283	426	1,237	541	617	346	41	253	61	10	40	2,393
506	Mänttä	209	91	110	360	172	169	121	15	88	18	2	13	709

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491	Mikkeli	8,240	3,976	3,965	7,086	3,361	3,373	3,296	749	2,159	948	80	571	19,569
507	Mäntyharju	5,985	2,667	3,069	2,860	1,146	1,527	1,702	325	1,150	374	26	207	10,921
588	Pertunmaa	1,422	687	688	1,662	781	798	930	204	628	226	21	137	4,239
593	Pieksämäki	7,081	2,707	4,003	7,039	3,601	3,047	2,551	435	1,719	587	37	350	17,259
618	Punkaharju	3,236	1,563	1,545	1,889	828	966	874	165	577	224	6	127	6,223
623	Puumala	6,233	2,753	3,193	1,538	581	866	1,583	312	1,088	240	4	125	9,595
681	Rantasalmi	2,333	1,000	1,237	2,468	1,151	1,184	875	162	587	346	22	184	6,021
696	Ristiina	3,388	1,604	1,660	1,933	805	1,020	1,147	243	768	282	21	163	6,750
740	Savonlinna	4,853	2,088	2,571	2,720	1,064	1,504	1,543	263	1,060	440	9	258	9,556
741	Savonranta	1,719	747	906	1,921	815	978	673	154	434	217	14	123	4,530
768	Sulkava	3,475	1,495	1,832	2,059	913	1,038	968	183	652	254	7	136	6,756
Total														
	Multi-source inventory	72,667	31,764	37,849	57,521	26,745	27,633	25,034	4,985	16,677	6,722	446	3,915	161,944
	Field inventory	72,903			58,988			26,392			7,680			165,964
	SE of field inventory	1,761			1,738			823			474			2,564
<b>Etelä-Pohjanmaa</b>														
<i>Municipality</i>														
4	Alahärmä	996	225	693	358	106	225	260	14	194	34	2	27	1,648
5	Alajärvi	3,287	989	2,058	715	294	375	721	30	533	69	5	47	4,792
10	Alavus	3,622	1,174	2,203	907	381	472	703	34	519	63	6	43	5,296
52	Evijärvi	1,380	344	931	565	217	320	352	19	266	38	2	28	2,335
74	Halsua	1,431	269	1,017	151	48	84	408	12	296	60	1	40	2,049
95	Himanka	943	197	671	390	131	233	342	9	267	33	1	24	1,709
145	Ilmajoki	1,681	533	1,034	1,514	672	765	453	35	318	88	24	53	3,737
151	Isojoki	2,385	675	1,532	1,680	681	910	737	39	570	112	14	83	4,913
152	Isokyrö	746	170	502	711	271	390	323	25	229	60	6	42	1,839
164	Jalasjärvi	3,093	874	2,010	1,189	512	608	690	28	506	83	6	59	5,055
175	Jurva	1,405	467	849	1,397	552	769	498	30	379	73	9	52	3,374
217	Kannus	1,507	327	1,057	467	159	272	637	15	496	47	1	34	2,659
218	Karijoki	602	188	376	472	169	277	170	9	128	22	3	15	1,266
232	Kauhajoki	4,328	1,028	2,957	1,571	601	876	867	35	663	95	8	74	6,860
233	Kauhava	1,676	463	1,093	600	233	332	402	23	300	40	3	29	2,718
236	Kaustinen	1,273	283	867	283	104	160	381	10	287	26	0	19	1,963

(continued)

Table 6b (continued)

	Pine						Spruce						Birch						Other deciduous tree species					
	Total		Pulpwood		Logs		Total		Pulpwood		Logs		Total		Pulpwood		Logs		Total		Pulpwood		Logs	
	(1,000 m <sup>3</sup> )																							
281	1,220	290	833	447	161	257	300	14	226	30	2	23	1,998											
300	2,168	790	1,244	739	320	382	378	23	273	28	2	19	3,314											
301	1,456	506	869	910	385	475	330	14	243	47	6	32	2,742											
315	2,405	522	1,669	807	287	468	841	23	640	68	2	51	4,121											
399	1,343	386	857	1,414	569	757	629	40	456	109	11	81	3,495											
403	1,709	441	1,146	564	217	312	491	22	374	44	4	32	2,807											
408	2,466	747	1,542	1,144	475	609	658	40	479	93	5	64	4,362											
414	1,213	418	722	288	120	152	230	9	168	21	1	14	1,752											
421	1,853	439	1,243	417	169	217	499	19	363	76	0	49	2,845											
429	1,523	322	1,068	513	171	306	496	14	379	43	1	33	2,575											
544	1,253	380	783	541	226	285	312	12	225	37	2	27	2,144											
584	2,717	486	1,950	279	95	156	483	14	330	107	3	71	3,586											
743	1,979	526	1,294	604	250	314	541	25	397	63	8	43	3,187											
759	2,685	817	1,680	769	327	394	536	23	393	58	3	38	4,048											
846	1,674	555	1,018	1,433	559	798	491	23	372	60	7	42	3,658											
849	2,030	522	1,349	570	236	297	735	26	554	103	0	74	3,438											
863	1,543	572	879	510	235	248	215	13	152	18	1	12	2,286											
885	645	151	439	144	64	72	185	5	138	24	0	17	998											
924	1,873	442	1,263	599	241	324	581	24	443	81	8	56	3,134											
934	1,106	287	729	307	127	162	317	16	237	39	4	27	1,769											
942	269	74	177	394	135	233	166	13	117	67	3	54	896											
971	334	77	229	181	59	111	114	9	84	18	1	15	648											
975	1,216	363	757	1,001	389	548	444	33	314	65	8	44	2,726											
989	3,921	1,248	2,414	1,683	780	808	806	62	573	97	7	59	6,507											
Total	70,958	19,568	46,001	29,231	11,728	15,754	18,722	883	13,881	2,338	183	1,649	121,249											
Multi-source inventory	70,430			29,561			20,009			3,137			123,138											
Field inventory	1,790			1,321			707			301			2,714											



<b>Keski-Suomi</b>														
<i>Municipality</i>														
77	Hankasalmi	1,949	823	1,034	3,313	1,675	1,504	854	169	572	276	11	172	6,393
172	Joutsa	1,551	627	849	2,906	1,377	1,396	914	175	610	379	18	242	5,749
179	Jyväskylä	289	112	162	464	226	218	130	24	87	53	2	34	937
180	Jyväskylän mlk	1,582	627	875	2,363	1,153	1,109	622	120	409	207	11	131	4,773
182	Jämsä	4,383	1,794	2,384	6,857	3,334	3,190	1,760	286	1,218	450	33	293	13,451
183	Jämsänkoski	1,614	607	919	1,911	907	912	526	85	348	162	8	100	4,212
216	Kannonkoski	2,157	669	1,355	1,510	661	764	542	60	377	109	5	64	4,318
226	Karstula	3,951	1,047	2,621	1,922	838	969	916	76	643	153	7	87	6,942
249	Keuruu	5,695	2,015	3,362	4,579	2,185	2,152	1,397	144	968	223	5	127	11,893
256	Kinnula	1,920	482	1,291	787	311	416	482	31	345	79	3	43	3,268
265	Kivijärvi	2,323	671	1,498	1,196	516	606	500	44	352	90	4	50	4,109
275	Konnevesi	1,910	770	1,041	2,761	1,338	1,303	733	136	493	217	8	133	5,621
277	Korpilahti	2,206	875	1,220	3,490	1,687	1,653	906	169	599	334	17	212	6,936
291	Kulhoinen	2,582	1,074	1,384	4,018	2,007	1,831	884	170	576	345	22	225	7,829
312	Kyyjärvi	1,781	431	1,205	530	205	288	350	20	249	51	2	28	2,711
410	Laukaa	2,261	911	1,235	3,166	1,538	1,492	828	160	550	271	13	170	6,525
415	Lervonmäki	1,557	571	905	1,938	893	955	550	105	360	151	9	98	4,196
435	Luhanka	725	284	404	1,158	545	558	370	68	248	149	7	95	2,403
495	Multia	3,452	1,017	2,220	2,226	1,023	1,087	844	89	579	134	6	82	6,656
500	Muurame	468	184	259	770	373	364	199	36	132	78	4	49	1,515
592	Petäjävesi	1,886	662	1,118	2,050	971	982	589	97	387	167	9	105	4,692
601	Pihlpuudas	4,564	1,244	2,995	2,865	1,211	1,464	1,262	106	897	260	10	151	8,950
633	Pylkönmäki	1,622	470	1,049	928	417	458	400	38	277	65	3	38	3,014
729	Saarjärvi	3,833	1,317	2,298	3,472	1,621	1,686	1,126	160	764	248	12	148	8,680
850	Toivakka	1,385	555	761	1,895	893	917	562	109	372	180	9	115	4,022
892	Uurainen	1,531	539	905	1,515	724	721	426	73	279	112	7	70	3,585
931	Virtasaari	4,955	1,685	2,974	5,058	2,286	2,504	1,660	218	1,159	449	25	274	12,123
992	Äänekoski	3,801	1,398	2,187	3,806	1,705	1,915	1,152	194	781	303	13	185	9,062
<b>Total</b>		67,933	23,460	40,508	69,456	32,619	33,414	21,483	3,161	14,629	5,696	285	3,522	164,568
Multi-source inventory		68,570			67,778			22,390			5,848			164,587
Field inventory		1,592			2,181			744			359			3,005

(continued)



<b>Pohjois-Karjala</b>															
<i>Municipality</i>															
45	Eno	3,942	1,353	2,360	2,885	1,298	1,410	1,405	216	988	238	4	112	8,470	
146	Ilomantsi	13,755	3,655	9,111	4,370	1,704	2,362	2,478	194	1,630	394	8	190	20,997	
167	Joensuu	4,985	1,624	3,125	4,543	2,001	2,323	1,740	255	1,191	324	10	150	11,593	
176	Juuka	6,905	1,896	4,613	4,234	1,885	2,087	1,807	171	1,255	486	16	259	13,432	
248	Kesälahti	2,303	892	1,286	824	301	469	578	79	398	171	3	93	3,876	
260	Kitee	4,024	1,475	2,336	2,888	1,247	1,464	1,352	200	908	310	5	120	8,574	
276	Kontiolahdi	4,348	1,823	2,319	2,004	887	1,004	1,252	113	918	266	10	138	7,871	
309	Outokumpu	2,181	861	1,225	1,402	529	783	757	80	573	300	3	165	4,641	
422	Lieksa	17,963	5,237	11,608	6,195	2,569	3,178	3,826	339	2,565	657	24	351	28,641	
426	Liperi	3,159	1,121	1,897	2,312	963	1,205	1,065	169	734	327	22	196	6,863	
541	Nurmes	5,951	1,579	3,970	4,268	1,745	2,254	2,094	190	1,424	470	11	255	12,784	
607	Polvijärvi	3,641	1,041	2,434	2,056	830	1,093	1,209	127	879	435	5	256	7,341	
632	Pyhäselkä	790	301	455	1,153	504	593	482	70	337	127	1	84	2,552	
707	Rääkkylä	1,886	708	1,112	1,479	695	715	891	113	630	198	7	111	4,454	
848	Tohmajärvi	3,847	1,282	2,394	2,767	1,292	1,333	930	144	592	237	5	117	7,782	
911	Valtimo	2,667	640	1,842	1,865	713	1,031	1,001	93	683	249	2	126	5,783	
Total															
		Multi-source inventory	82,349	25,487	52,086	45,247	19,162	23,303	22,868	2,553	15,707	5,190	136	2,725	155,654
		Field inventory	79,661			47,010			24,071			5,948			156,690
		SE of field inventory	1,863			1,721			726			407			2,553
<b>Kainuu</b>															
<i>Municipality</i>															
105	Hyrnsalmi	5,452	1,445	3,627	2,482	846	1,447	1,433	33	986	142	7	78	9,509	
205	Kajaani	8,106	1,719	5,745	1,450	414	871	2,339	34	1,658	266	10	172	12,161	
290	Kuhmo	22,607	6,924	14,131	7,186	2,193	4,389	4,253	104	2,763	472	11	248	34,518	
578	Paltamo	3,735	915	2,591	1,746	598	1,019	1,253	36	902	152	4	87	6,887	
620	Puolanka	8,382	2,093	5,639	4,207	1,414	2,498	2,237	63	1,582	226	7	124	15,053	
697	Ristijärvi	3,002	797	2,013	1,830	616	1,073	1,059	33	761	117	3	61	6,008	
765	Sotkamo	10,772	2,497	7,564	5,093	1,682	2,969	3,328	89	2,308	446	21	260	19,639	
777	Suomussalmi	19,927	5,724	12,690	7,285	2,162	4,534	3,802	70	2,601	376	14	233	31,389	

(continued)



617	Pulkkila	1,656	302	1,218	305	81	196	649	8	475	95	6	71	2,705
625	Pyhäjoki	1,875	338	1,387	632	154	413	901	15	696	150	10	94	3,558
626	Pyhäsalmi	5,157	1,035	3,768	1,941	597	1,180	2,057	54	1,522	298	10	190	9,453
630	Pyhäntä	3,636	708	2,624	379	93	247	989	13	694	116	5	82	5,120
678	Raahе	1,850	394	1,299	640	189	400	837	10	636	176	14	118	3,502
682	Rantsila	2,752	439	2,025	325	81	210	974	9	695	113	7	83	4,164
691	Reisjärvi	2,033	398	1,460	430	159	235	484	21	338	95	3	48	3,042
746	Sievі	3,060	641	2,161	555	195	312	762	26	548	110	6	59	4,486
748	Siikajoki	3,499	632	2,514	597	151	394	1,360	9	967	198	8	153	5,654
832	Taivalkoski	7,766	1,733	5,486	3,946	1,121	2,553	1,752	29	1,209	262	3	160	13,727
859	Tymävä	1,362	195	1,004	86	22	55	445	4	304	40	3	30	1,933
889	Utajärvi	6,399	1,208	4,547	608	142	392	1,298	19	942	131	7	97	8,437
926	Vihanti	1,745	330	1,254	431	122	272	660	7	494	107	7	74	2,944
972	Yli-Ii	2,453	428	1,778	519	95	361	734	6	525	70	3	46	3,775
973	Ylikiminki	3,844	696	2,765	771	176	519	965	7	706	96	6	73	5,675
977	Ylivieska	1,903	401	1,353	791	275	459	724	14	557	136	6	96	3,554
Total														
	Multi-source inventory	120,251	24,129	85,774	35,035	9,711	22,334	36,454	560	26,568	5,347	225	3,605	197,088
	Field inventory	118,164			39,166			37,967			5,789			201,086
	SE of field inventory	2,312			1,749			1,012			384			3,274
<b>Lapland</b>														
<i>Municipality</i>														
47	Enontekiö	4,808	850	3,702	405	93	278	3,294	0	1,017	18	0	1	8,526
148	Inari	44,386	7,056	34,857	3,079	812	2,076	7,296	0	3,403	108	0	48	54,870
240	Kemi	103	11	82	187	64	110	148	1	109	18	0	10	456
241	Keminmaa	898	133	670	1,240	330	793	1,144	14	836	97	1	57	3,379
261	Kitilä	15,725	2,984	11,497	6,154	1,186	4,351	5,804	35	4,039	264	15	133	27,947
273	Kolari	7,532	1,593	5,260	2,029	236	1,466	1,980	16	1,334	124	1	68	11,666
320	Kemijärvi	11,766	2,139	8,551	2,117	324	1,532	2,052	11	1,343	112	4	43	16,047
498	Muonio	6,195	1,659	4,201	1,285	292	879	989	5	587	47	0	25	8,516
583	Pelkosenniemi	4,741	747	3,536	1,378	204	989	1,510	5	967	108	5	60	7,736
614	Posio	9,720	1,967	7,002	2,919	685	2,003	1,395	11	986	144	1	66	14,177
683	Ranua	8,163	1,110	6,102	1,906	226	1,401	1,739	6	1,106	114	2	59	11,922

(continued)

Table 6b (continued)

	Pine			Spruce			Birch			Other deciduous tree species			
	Pulpwood		Total	Pulpwood		Total	Pulpwood		Total	Pulpwood		Total	
	Logs	Pulpwood		Logs	Pulpwood		Logs	Pulpwood		Logs	Pulpwood		
	(1,000 m <sup>3</sup> )												
698	23,234	4,069	16,885	6,475	755	4,803	4,914	48	3,393	364	8	198	34,987
732	14,676	2,671	10,856	7,055	1,706	4,701	3,794	30	2,634	370	18	208	25,895
742	19,320	3,598	14,318	5,844	1,450	3,893	3,128	21	2,181	149	2	58	28,441
751	3,267	629	2,216	1,354	246	941	2,071	21	1,488	119	2	79	6,810
758	26,030	5,131	19,138	7,970	1,742	5,558	6,551	11	4,383	182	11	82	40,734
845	3,141	398	2,373	2,640	435	1,870	1,970	18	1,378	160	6	103	7,912
851	1,557	182	1,195	2,372	551	1,590	2,008	30	1,437	183	4	111	6,121
854	5,114	993	3,588	1,743	202	1,269	1,605	11	1,085	135	1	76	8,596
890	329	6	282	29	5	22	1,351	0	268	7	0	0	1,716
976	5,230	879	3,654	1,893	215	1,386	2,240	19	1,523	125	2	79	9,488
Total													
Multi-source inventory	215,938	38,807	159,964	60,075	11,759	41,910	56,982	312	35,496	2,947	84	1,565	335,942
Field inventory	213,387			64,963			58,913			3,381			340,643
SE of field inventory	4,772			2,584			1,747			287			5,372

**Table 7a** The mean volume of growing stock by tree species and roundwood assortment on forest land (By forestry centres).

	Pine						Spruce			Birch			Other deciduous tree species			All tree species			
	Total		Pulpwood		Logs		Total		Pulpwood		Logs		Total		Pulpwood		Logs		
	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Logs		Pulpwood	Logs	Pulpwood
(m <sup>3</sup> /ha)																			
<b>Åland</b>																			
<i>Municipality</i>																			
35 Brändö	34.5	1.3	31.3	1.5	0.2	1.3	27.1	0.0	23.2	28.9	0.2	18.2	92.1						
43 Eckerö	79.3	10.3	66.7	40.2	10.2	26.4	17.9	0.5	14.7	8.7	0.2	7.0	146.2						
60 Finström	72.0	9.4	60.6	40.3	10.5	26.7	18.5	0.7	15.1	11.2	0.2	8.9	141.9						
62 Föglö	76.7	10.1	64.4	31.1	8.1	20.7	14.6	0.3	11.8	13.5	0.3	9.1	136.0						
65 Geta	80.1	9.5	68.4	37.2	9.0	25.0	14.7	0.5	11.8	7.4	0.1	5.8	139.4						
76 Hammarland	75.0	9.4	63.4	39.3	9.8	26.2	19.2	0.6	15.8	11.0	0.2	8.9	144.5						
170 Jomala	75.4	10.2	63.1	42.3	10.9	28.1	18.4	0.7	15.0	11.6	0.3	9.2	147.7						
295 Kumlunge	61.4	6.8	52.2	13.3	2.8	9.5	19.8	0.2	16.3	21.1	0.5	14.5	115.6						
318 Kökar	33.6	5.5	26.5	7.1	0.5	6.2	23.5	0.0	18.7	28.8	0.7	19.1	93.0						
417 Lemland	70.3	9.3	59.1	40.4	10.6	26.6	20.4	0.7	16.7	12.8	0.4	10.1	143.9						
438 Lumparland	82.4	10.9	69.4	38.5	9.7	25.6	14.6	0.5	11.8	9.7	0.3	7.3	145.1						
478 Mariehamn	61.1	6.7	52.4	26.0	5.9	17.9	15.9	0.5	13.0	12.0	0.2	9.2	115.1						
736 Saltvik	85.7	10.9	72.5	42.1	10.6	28.2	15.2	0.5	12.3	8.2	0.2	6.3	151.2						
766 Sottunga	50.0	6.1	42.1	15.8	3.8	10.9	18.3	0.2	14.4	18.8	0.4	12.6	102.9						
771 Sund	78.0	10.1	65.8	39.1	9.6	26.4	16.8	0.6	13.6	10.2	0.3	7.9	144.2						
941 Vårdö	79.1	9.9	67.0	34.5	8.3	23.2	14.3	0.3	11.5	9.5	0.2	7.0	137.4						
<b>Total</b>																			
Multi-source inventory	73.1	9.3	61.7	35.1	8.8	23.5	17.9	0.5	14.6	12.4	0.3	9.2	138.5						
Field inventory	69.6			33.0			17.3			14.8			134.7						
SE of field inventory	3.4			3.0			1.3			1.9			5.3						
<b>Rannikko/Etelärannikko</b>																			
<i>Municipality</i>																			
40 Dragsfjärd	81.6	27.2	51.0	44.4	17.5	24.7	11.7	2.1	8.4	5.1	0.6	2.8	142.8						
49 Espoo-Esbo	49.2	22.0	25.6	71.2	36.5	31.0	29.0	8.6	17.7	15.6	2.8	9.5	165.0						
78 Hanko-Hangö	78.1	24.8	51.1	30.8	9.5	19.5	22.2	3.6	16.4	7.2	2.4	4.1	138.3						
91 Helsinki-Helsingfors	33.0	13.0	18.8	49.5	23.0	23.3	35.1	9.3	21.0	19.6	2.6	12.3	137.2						

(continued)

Table 7a (continued)

	Pine						Spruce			Birch			Other deciduous tree species			All tree species			
	Total		Pulpwood		Logs		Total		Pulpwood		Logs		Total		Pulpwood		Logs		
	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Total	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Total	Pulpwood	Logs		Pulpwood	Logs	Pulpwood
	(m <sup>3</sup> /ha)																		
92	32.5	12.9	18.2	71.3	32.3	34.7	35.1	9.2	21.5	18.5	2.1	12.5	157.4						
101	86.1	24.3	57.9	30.4	11.1	17.9	5.7	0.9	3.7	4.4	1.1	3.1	126.5						
149	62.1	26.8	33.3	75.8	37.6	34.5	24.8	7.5	15.2	7.2	2.8	3.4	169.8						
150	96.5	35.8	57.5	31.3	10.7	18.7	6.6	0.8	4.9	6.5	1.9	4.5	140.9						
220	53.3	19.9	31.5	63.5	28.7	31.6	26.3	7.0	17.2	8.5	2.5	4.6	151.7						
235	53.2	21.7	29.6	57.3	29.6	24.5	32.3	9.5	20.2	14.5	2.4	8.8	157.2						
243	77.4	30.4	44.1	45.8	20.1	23.5	12.1	2.4	8.0	4.3	0.8	2.6	139.7						
257	53.1	24.2	27.3	69.8	37.3	29.0	26.4	7.8	16.2	11.9	3.0	6.3	161.1						
279	79.5	23.0	53.0	29.2	11.0	16.6	7.3	0.9	5.3	4.7	0.6	3.5	120.7						
407	37.8	14.6	21.7	88.8	38.1	46.0	23.2	4.4	16.3	5.0	0.8	3.1	154.8						
424	40.2	15.1	23.3	83.8	35.9	43.6	21.4	3.9	14.9	5.0	0.8	3.1	150.4						
434	58.9	21.9	34.4	71.4	30.7	36.9	21.8	4.1	16.3	4.3	0.5	3.0	156.4						
533	81.1	22.7	54.9	31.8	10.9	19.3	13.4	1.3	10.6	4.8	0.2	3.4	131.0						
573	73.1	25.7	44.3	33.7	13.2	18.7	13.8	2.3	9.7	6.1	0.6	3.7	126.6						
585	46.5	15.7	28.6	72.3	30.6	37.7	22.5	3.8	16.5	5.6	0.9	3.8	146.9						
606	66.4	22.5	41.4	47.1	18.8	25.6	15.4	3.2	10.1	4.9	1.1	3.2	133.8						
638	46.1	15.0	29.3	78.4	32.7	41.2	22.9	4.4	15.7	8.2	1.1	6.1	155.6						
701	47.4	15.9	29.5	66.7	26.0	36.7	25.9	4.6	19.5	5.5	0.7	3.8	145.6						
753	44.7	16.8	26.4	82.5	36.8	40.9	28.1	6.7	18.0	11.2	1.3	8.2	166.5						
755	49.7	24.0	24.2	89.6	48.3	37.0	23.7	6.4	15.0	11.4	3.5	5.5	174.5						
835	70.0	23.5	44.1	45.9	18.5	25.0	16.0	3.0	10.8	5.6	1.3	3.5	137.4						
923	77.0	29.7	44.5	45.6	19.7	23.6	12.4	2.7	8.1	3.7	0.6	2.2	138.7						
Total	58.8	21.2	35.4	61.1	26.8	31.0	20.7	4.5	13.8	7.7	1.4	4.8	148.2						
	57.8			61.3			23.2			10.5			152.9						
	2.5			3.1			1.3			0.9			3.6						
<b>Rannikko/Pohjanmaa</b>																			
<i>Municipality</i>																			
231	27.1	6.7	18.8	56.7	17.6	36.0	18.7	1.2	13.9	6.2	0.0	4.1	108.7						
272	44.4	9.9	31.5	34.0	10.4	21.6	21.5	1.0	16.9	3.1	0.2	2.1	103.1						
280	30.2	8.5	19.4	45.7	14.0	28.5	25.8	2.0	19.2	2.5	0.2	1.7	104.1						



287	Kristinestad- Kristiinankaupunki	39.6	11.8	25.2	56.2	17.4	35.6	18.1	1.5	13.8	3.4	0.5	2.3	117.2
288	Kronoby-Kruunupyy	53.8	12.5	37.5	29.4	9.7	18.1	17.2	0.8	13.3	1.7	0.1	1.2	102.1
440	Larsmo-Luoto	40.9	9.5	28.7	30.2	9.5	18.9	18.2	0.9	13.9	3.3	0.3	2.1	92.6
475	Malax-Maalahi	30.8	8.0	20.3	39.1	13.4	23.0	23.7	1.7	17.5	3.6	0.5	2.5	97.2
499	Korsholm-Mustasaari	26.1	7.9	16.7	55.4	20.5	32.3	19.5	1.3	14.5	5.4	0.4	4.3	106.4
545	Närpes-Närpö	37.5	11.5	23.7	53.9	17.2	33.6	19.2	1.3	14.4	3.0	0.3	2.0	113.5
559	Oravais-Oravainen	36.5	8.7	25.6	36.5	11.1	22.8	22.1	1.6	16.5	3.1	0.3	2.2	98.2
598	Jakobstad-Pietarsaari	38.1	7.4	28.3	28.1	7.0	18.6	25.2	1.4	19.8	3.6	0.3	2.5	95.0
599	Pedersöre-Pedersören kunta	48.1	11.6	33.2	28.8	8.5	18.3	18.3	1.0	14.2	2.1	0.2	1.5	97.2
893	Nykarleby-Uusikaarlepyy	40.8	9.1	28.8	28.3	7.6	18.1	19.4	1.1	14.8	1.9	0.1	1.4	90.4
905	Vaasa-Vasa	28.9	9.3	18.1	62.6	21.8	37.9	21.4	1.8	16.4	5.8	0.3	4.7	118.7
945	Vörå-Maxmo-Vöyri- Maksamaa	33.0	8.2	22.8	50.1	17.6	29.4	22.1	2.0	16.0	5.4	0.5	4.1	110.7
Total		38.7	10.0	26.0	42.5	13.8	26.1	19.9	1.3	15.1	3.3	0.3	2.4	104.3
	Multi-source inventory	37.6			45.1			18.9			4.1			105.7
	Field inventory	1.5			2.0			0.9			0.5			2.8
<b>Louais-Suomi</b>														
<i>Municipality</i>														
6	Alastaro	57.86	22.78	33.08	66.69	31.73	31.28	19.31	2.33	13.62	4.17	0.46	2.82	148.03
17	Askainen	88.8	37.8	48.2	37.4	13.7	21.2	10.9	1.7	7.6	7.4	0.9	5.2	144.4
19	Aura	66.8	31.8	32.7	62.7	29.0	30.5	14.2	2.2	9.2	6.5	1.1	4.7	150.2
50	Eura	64.4	25.2	36.7	57.0	25.1	28.4	18.1	2.1	12.6	4.1	0.6	2.8	143.6
51	Eurajoki	65.3	26.7	36.0	59.7	25.2	30.8	17.9	1.7	12.6	5.1	0.7	3.6	148.0
73	Halikko	74.7	32.7	39.5	56.5	25.3	28.8	14.5	3.1	9.2	6.9	1.0	4.6	152.6
79	Harjavalta	59.2	19.6	37.1	55.2	23.2	28.4	20.6	2.2	14.6	3.4	0.4	2.3	138.4
99	Honkajoki	64.2	18.9	42.0	12.5	4.5	7.1	14.1	0.8	10.7	2.1	0.3	1.5	92.9
102	Huitinen	47.8	17.0	29.0	77.7	35.8	37.3	24.2	3.1	17.0	3.6	0.4	2.3	153.3
181	Jämijärvi	58.1	20.5	34.4	42.6	19.9	20.2	17.2	2.0	12.6	3.7	0.3	2.7	121.7
202	Kaarina	72.9	29.8	40.5	41.6	17.6	22.0	11.7	2.0	7.8	7.5	0.9	4.9	133.7
214	Kankaanpää	58.2	18.3	36.8	35.3	16.5	16.7	15.9	1.6	11.8	2.7	0.2	1.9	112.1
230	Karvia	62.5	17.6	41.9	14.8	5.4	8.4	13.7	0.8	10.2	2.1	0.3	1.5	93.2
252	Kiikka	65.9	31.0	32.9	68.3	33.2	31.9	15.7	2.6	10.4	5.5	0.9	3.8	155.5
254	Kiikoinen	51.5	18.3	30.5	63.6	30.2	29.7	18.5	2.5	13.5	3.3	0.3	2.3	136.9

(continued)

Table 7a (continued)

	Pine						Spruce			Birch			Other deciduous tree species			All tree species		
	Logs		Pulpwood		Total	Logs	Pulpwood		Total	Logs		Pulpwood		Total	Logs		Pulpwood	
	(m <sup>3</sup> /ha)																	
259	67.9	31.8	33.9	63.5	29.9	30.4	15.8	2.8	10.2	6.3	1.1	4.3	153.5					
262	58.1	23.0	32.8	64.1	26.5	33.4	20.2	2.2	14.3	4.7	0.7	3.3	147.1					
271	60.4	21.8	35.9	58.7	25.8	29.4	18.5	2.3	12.9	3.1	0.4	2.1	140.6					
284	50.3	21.4	39.7	90.7	46.5	39.7	20.0	2.4	14.1	4.2	0.4	2.7	165.2					
304	90.1	37.5	50.1	30.6	9.8	18.6	11.2	2.2	7.6	10.9	2.2	7.4	142.9					
308	61.2	28.4	30.9	80.6	38.9	37.9	17.1	2.6	11.6	5.9	0.9	4.0	164.7					
319	64.6	25.4	36.9	54.7	25.0	26.5	17.8	2.2	12.5	3.5	0.5	2.4	140.6					
400	71.9	29.2	40.0	53.4	22.9	27.2	15.2	1.5	10.4	4.0	0.6	2.8	144.5					
406	70.3	28.2	39.3	52.6	23.0	26.3	14.6	1.5	10.2	3.9	0.5	2.6	141.3					
413	54.1	19.9	31.3	54.9	24.3	27.1	19.4	2.5	14.2	3.5	0.3	2.5	131.9					
419	70.8	29.4	38.7	39.6	16.3	21.1	11.0	1.2	7.9	4.9	0.6	3.3	126.2					
423	74.7	34.7	37.6	58.3	27.3	28.1	12.2	1.8	8.1	5.6	0.9	4.0	150.8					
430	51.0	21.7	27.6	91.0	47.0	39.7	19.3	2.3	13.7	4.2	0.5	2.7	165.5					
442	60.0	23.8	33.0	79.7	34.4	40.0	25.2	2.0	18.7	3.7	0.6	2.6	168.5					
480	59.4	25.9	31.5	69.3	33.0	32.7	17.5	2.4	11.9	5.4	0.7	3.8	151.6					
481	68.2	28.3	37.2	47.6	20.1	24.8	12.6	1.4	8.8	5.9	0.8	4.1	134.4					
482	51.7	19.3	30.5	76.7	38.7	33.8	20.1	2.2	14.1	3.8	0.4	2.4	152.2					
484	56.5	17.6	34.7	47.3	19.2	24.9	17.9	1.9	12.9	3.5	0.3	2.5	125.1					
485	95.8	41.0	51.9	34.9	12.3	20.0	10.9	2.1	7.5	9.2	1.6	6.7	150.7					
501	73.6	34.8	36.4	60.0	27.9	29.1	15.2	2.6	9.7	6.2	1.0	4.3	154.9					
503	63.5	24.9	36.0	51.1	22.8	25.3	16.3	1.9	11.4	4.3	0.6	3.0	135.2					
529	88.9	37.4	48.7	36.6	13.8	20.6	9.7	1.6	6.8	6.8	0.9	4.8	142.1					
531	50.9	18.6	30.0	71.2	30.8	35.7	24.4	2.4	17.8	3.7	0.5	2.5	150.2					
537	50.6	20.1	28.2	68.4	31.5	33.0	20.6	2.5	15.1	3.0	0.4	2.1	142.6					
538	70.8	30.4	38.1	62.6	30.1	29.2	14.2	1.9	9.8	3.5	0.5	2.3	151.0					
561	69.7	28.8	38.4	50.1	23.1	24.2	16.2	2.2	11.1	4.2	0.6	3.0	140.2					
577	79.2	34.9	41.8	49.8	22.1	25.6	12.2	2.2	8.1	5.2	0.6	3.5	146.4					
586	77.1	36.2	38.5	60.5	28.4	29.3	14.6	2.7	9.3	5.7	1.0	4.0	157.9					
587	68.9	32.8	34.0	64.5	30.2	31.1	14.9	2.5	9.7	6.3	1.1	4.3	154.5					
602	77.3	33.3	41.4	48.9	21.8	25.1	11.1	2.0	7.4	5.7	0.7	3.8	143.1					
608	56.0	22.6	31.0	76.6	36.6	35.9	18.9	2.4	13.9	3.0	0.3	2.0	154.5					

609	Pori	49.9	18.9	28.3	67.9	29.2	34.3	22.4	2.2	16.3	3.8	0.5	2.7	144.0
631	Pyhäranta	76.6	32.8	41.4	55.5	22.9	29.2	15.2	1.7	10.4	4.9	0.7	3.4	152.2
636	Pöytyä	63.5	28.7	32.6	63.8	29.6	30.8	16.3	2.5	11.0	5.7	0.9	4.1	149.4
680	Raisio	72.6	31.0	38.9	42.6	18.5	21.9	11.1	1.7	7.6	7.2	1.1	4.6	133.4
684	Rauma	73.9	30.5	40.6	50.8	20.9	26.8	14.8	1.5	10.3	5.2	0.7	3.6	144.7
704	Rusko	68.3	28.8	36.7	49.8	21.6	25.5	12.0	1.4	8.4	6.3	0.9	4.4	136.4
705	Rymättylä	93.8	38.1	53.0	31.3	11.3	18.0	8.5	1.5	5.9	7.9	1.3	5.5	141.5
734	Salo	69.4	31.5	35.4	56.8	25.7	28.2	15.2	2.5	9.7	6.5	1.1	4.5	147.8
738	Sauvo	73.8	30.7	40.4	43.8	18.6	23.0	11.7	1.9	7.9	5.7	0.7	3.8	135.0
747	Sihainen	57.4	18.1	35.7	42.9	18.5	21.6	17.8	2.0	12.9	3.6	0.3	2.5	121.7
761	Somero	53.2	22.6	28.8	82.1	40.9	37.2	20.8	3.0	14.4	5.7	0.8	3.7	161.8
776	Suomusjärvi	61.7	28.0	31.6	67.3	34.0	30.3	15.3	2.6	10.2	5.9	0.9	4.0	150.3
783	Säkylä	69.3	28.2	38.7	52.7	24.5	25.2	15.7	2.0	11.0	3.7	0.5	2.5	141.3
784	Särkisalo-Finby	74.1	33.3	38.2	60.1	27.1	30.2	13.6	3.0	8.5	7.5	1.1	5.0	155.3
833	Taivassalo	91.8	38.3	50.7	31.3	10.9	18.2	10.0	1.8	6.8	7.7	1.2	5.4	140.8
838	Tarvasjoki	65.1	30.5	32.5	65.8	29.9	32.5	14.9	2.4	9.7	7.1	1.3	5.1	152.9
853	Turku-Åbo	70.6	29.5	38.5	41.3	17.6	21.6	12.2	1.8	8.2	7.4	1.1	4.9	131.5
886	Uusikaupunki	52.7	19.6	30.5	60.8	26.1	30.8	21.5	2.6	15.7	3.1	0.3	2.2	138.1
895	Uusikaupunki	73.7	30.2	40.6	37.0	14.3	20.4	12.3	1.3	8.7	5.4	0.6	3.7	128.4
906	Vahto	67.8	28.7	36.7	61.3	29.1	28.9	15.9	2.2	11.0	3.9	0.5	2.7	148.9
913	Vampula	50.1	19.7	28.6	80.0	36.9	38.8	24.0	3.3	16.9	4.2	0.5	2.8	158.3
918	Vehmaa	75.1	30.9	41.4	35.6	13.9	19.7	11.4	1.3	8.1	5.4	0.6	3.5	127.5
920	Velkua	93.9	37.1	54.4	24.2	7.2	15.6	8.6	1.9	5.8	10.5	2.1	7.3	137.1
979	Yläne	65.4	26.0	36.9	54.4	25.1	26.3	17.3	2.2	12.1	3.7	0.5	2.6	140.8
Total														
	Multi-source inventory	63.4	25.0	35.8	55.1	24.8	27.2	16.9	2.1	11.9	4.4	0.6	3.0	139.8
	Field inventory	64.4			57.1			17.3			4.6			143.4
	SE of field inventory	1.3			1.8			0.6			0.4			2.1
<b>Häme-Uusimaa</b>														
<i>Municipality</i>														
15	Arjärvi	40.3	19.3	19.1	83.0	39.9	38.3	17.1	4.0	10.8	6.5	0.6	4.3	146.9
16	Asikkala	41.8	22.7	17.6	82.8	43.4	35.7	23.6	5.9	15.1	9.4	1.2	6.1	157.6
18	Askola	42.0	22.1	18.6	95.4	45.0	45.6	22.2	6.1	13.7	6.4	1.0	3.9	166.1
61	Forssa	42.0	19.0	21.6	92.0	48.0	39.4	19.4	3.3	13.4	2.4	0.4	1.7	155.8
81	Hartola	41.1	20.4	19.5	76.1	35.9	36.8	29.3	6.6	19.9	9.5	1.1	5.5	155.9

(continued)

Table 7a (continued)

	Pine						Spruce			Birch			Other deciduous tree species			All tree species	
	Logs		Pulpwood		Total	Logs	Pulpwood		Total	Logs	Pulpwood		Total	Logs	Pulpwood		
	(m <sup>3</sup> /ha)																
82	44.0	18.7	23.7	71.8	34.4	33.2	26.8	5.7	18.0	3.0	0.6	1.9	145.6				
83	39.4	20.0	18.4	109.4	59.6	45.4	19.3	3.8	13.5	8.7	1.1	6.6	176.8				
86	41.5	17.9	21.9	92.4	50.2	38.3	18.5	3.9	12.2	6.2	1.2	3.5	158.6				
98	35.1	18.3	15.4	90.6	48.1	38.2	15.7	2.9	10.4	8.1	1.1	5.1	149.5				
103	38.7	16.9	20.7	103.5	51.6	47.9	22.8	3.1	17.1	2.3	0.3	1.7	167.3				
106	43.9	17.8	24.0	86.2	46.4	36.0	20.0	4.3	13.1	6.5	1.1	3.9	156.5				
109	40.2	18.1	20.7	81.3	41.1	36.0	25.5	5.3	17.3	6.3	0.9	4.4	153.2				
111	56.1	28.4	25.4	56.7	25.9	28.1	23.7	5.7	15.1	7.2	0.7	4.4	143.7				
165	39.1	17.8	19.9	95.8	51.8	39.8	21.4	4.0	14.8	5.9	1.0	3.8	162.0				
169	47.2	21.8	24.0	98.1	50.8	42.8	18.9	3.0	13.3	3.0	0.4	2.1	167.1				
186	25.8	11.0	13.4	80.7	40.8	36.0	21.6	3.8	13.9	11.7	1.4	5.8	139.8				
210	41.3	16.5	23.1	79.7	38.2	37.2	24.6	4.4	17.3	1.7	0.2	1.1	147.3				
223	52.4	21.5	28.8	63.5	33.3	27.7	18.3	3.1	12.0	3.2	0.5	2.1	137.3				
224	44.4	19.6	23.1	90.8	49.2	37.5	21.4	4.7	14.5	6.0	0.8	4.1	162.6				
245	30.5	14.4	14.4	82.9	37.1	41.2	25.5	5.2	16.2	12.3	1.0	7.5	151.2				
283	29.3	13.9	14.0	101.7	53.3	43.7	17.4	2.8	12.3	6.4	1.0	4.1	154.7				
316	33.0	14.3	17.1	100.7	54.1	42.5	19.1	3.9	12.6	6.4	0.8	3.8	159.2				
398	35.0	18.9	14.9	69.3	35.1	30.3	16.0	3.1	9.8	14.3	1.6	9.1	134.6				
401	33.9	16.2	16.5	95.3	50.6	40.1	17.0	2.6	12.4	5.7	0.8	3.8	152.0				
433	43.2	18.6	22.9	89.5	48.5	37.1	21.3	4.6	14.2	4.6	0.7	3.2	158.6				
444	48.2	22.3	24.3	77.3	42.4	31.5	21.0	4.0	14.3	8.3	1.2	4.9	154.7				
504	43.2	21.1	20.4	86.2	39.7	41.6	21.8	5.4	13.8	5.6	0.8	3.3	156.8				
505	36.9	16.2	19.2	110.2	59.9	45.9	18.5	4.4	11.8	5.9	0.8	3.3	171.4				
532	46.8	25.2	20.0	61.4	30.3	28.1	17.6	4.0	10.8	10.6	1.3	6.6	136.4				
540	47.8	20.3	25.7	73.9	37.4	32.9	20.2	3.8	13.9	4.5	0.7	3.1	146.4				
543	37.3	15.0	20.3	87.1	45.3	37.9	22.2	4.8	14.6	11.2	1.6	7.1	157.7				
560	37.4	18.7	17.1	80.3	41.9	34.3	15.2	3.3	9.5	6.8	0.8	4.2	139.8				
576	45.0	24.6	18.9	90.9	51.0	35.6	21.4	4.4	14.9	6.2	0.9	4.1	163.5				
611	37.4	18.9	17.1	87.3	40.0	42.9	23.1	5.1	14.7	8.2	1.3	4.6	155.9				
616	33.3	16.1	15.9	88.2	45.0	38.9	20.3	4.4	13.1	7.3	1.0	4.1	149.0				

692	Renko	49.5	22.8	25.0	86.8	47.6	35.4	21.5	5.2	13.9	2.7	0.5	1.8	160.5
694	Riihimäki	37.3	15.8	19.9	94.3	52.3	38.0	21.0	4.4	13.9	8.1	1.6	4.9	160.6
737	Sammatti	50.9	21.4	27.5	61.7	31.5	27.5	19.0	3.3	12.8	3.7	0.6	2.3	135.3
781	Sysmä	46.7	24.4	20.8	74.6	35.5	35.5	29.7	7.1	20.0	10.6	1.3	6.8	161.6
834	Tammela	49.2	20.4	27.0	78.6	40.2	34.2	20.7	3.6	14.6	2.5	0.3	1.8	150.9
855	Tuulos	32.9	15.8	16.0	96.5	51.7	40.5	16.8	2.8	12.0	5.5	0.8	3.8	151.7
858	Tuusula	33.6	14.0	17.8	93.5	47.2	42.1	22.8	4.7	14.8	10.9	1.4	6.7	160.7
927	Vihti	46.0	19.7	24.3	84.2	44.3	35.8	23.2	5.2	15.6	11.3	1.6	7.7	164.7
981	Ypäjä	47.2	22.6	23.5	100.8	50.1	46.1	20.8	3.3	14.6	3.3	0.4	2.3	172.1
Total														
	Multi-source inventory	42.6	20.2	20.9	84.5	43.7	36.8	21.5	4.6	14.4	6.8	0.9	4.3	155.4
	Field inventory	40.8			83.8			21.9			8.4			155
	SE of field inventory	1.3			2			0.7			0.5			2.1
<b>Kaakkois-Suomi</b>														
<i>Municipality</i>														
44	Elimäki	40.7	16.7	22.3	84.7	40.4	40.2	18.0	3.4	12.2	5.6	0.7	3.7	149.0
75	Hamina	59.9	19.9	37.1	59.8	25.9	30.8	13.1	2.2	9.0	3.4	0.4	2.2	136.2
142	Iitti	43.9	16.0	25.7	69.4	32.1	33.6	18.9	3.4	12.7	6.0	0.7	3.9	138.1
153	Imatra	54.7	25.5	27.2	63.6	28.6	32.1	23.7	5.2	15.7	7.9	1.1	4.3	149.8
163	Jaala	74.3	31.8	39.1	46.5	19.5	24.4	23.5	4.1	16.6	6.1	0.5	4.3	150.5
173	Joutseno	58.3	28.2	28.1	62.9	29.4	30.6	24.8	5.6	16.4	8.8	1.3	4.9	154.9
285	Kotka	54.5	21.1	30.7	55.3	24.4	27.8	19.7	3.5	13.8	5.7	0.5	3.9	135.2
286	Kouvola	44.2	13.1	28.8	50.7	21.1	26.6	18.4	3.0	12.4	5.9	0.6	3.7	119.2
306	Kuusankoski	47.6	15.3	29.9	61.8	26.9	31.5	20.0	3.3	13.6	3.0	0.6	3.9	135.5
405	Lappeenranta	57.5	22.1	32.5	67.5	33.7	30.8	16.9	3.3	11.6	4.9	0.7	3.0	146.8
416	Lemi	64.1	28.8	32.7	63.0	31.8	28.4	22.0	4.8	14.7	6.8	0.9	4.3	155.8
441	Luumäki	63.0	21.1	38.6	61.0	27.9	30.1	14.9	2.8	10.3	3.3	0.4	2.2	142.2
489	Miehikkälä	60.1	18.0	38.0	57.4	24.6	29.6	11.1	1.7	7.9	2.4	0.3	1.6	131.1
580	Parikkala	54.1	23.6	28.0	41.3	16.4	22.4	19.7	3.5	13.3	8.1	0.4	4.6	123.1
624	Pyhäää-Pyttis	50.3	20.1	27.8	62.1	27.7	30.9	23.5	4.9	16.0	6.4	0.6	4.3	142.3
689	Raujarvi	58.1	27.1	28.9	55.5	25.9	26.7	22.9	4.8	15.3	8.0	0.8	4.5	144.4
700	Ruokolahu	72.4	30.3	38.8	45.6	20.7	22.4	19.9	4.4	13.1	4.4	0.4	2.5	142.2
739	Savitaipale	78.6	32.0	42.8	46.3	21.3	22.7	21.7	5.0	14.3	4.0	0.3	2.7	150.6
754	Anjalankoski	56.0	18.3	34.8	61.4	26.2	31.9	14.7	2.6	10.1	3.7	0.5	2.4	135.7
775	Suomenniemi	82.3	37.5	41.0	31.9	13.6	16.5	20.0	4.9	13.0	3.8	0.2	2.3	138.0

(continued)

Table 7a (continued)

	Pine						Spruce			Birch			Other deciduous tree species			All tree species			
	Total		Logs		Pulpwood		Total		Logs		Pulpwood		Total		Logs		Pulpwood		
	(m <sup>3</sup> /ha)																		
831	77.7	36.5	38.1	41.1	18.4	20.5	24.2	5.5	15.9	6.5	0.9	3.7	149.5						
909	68.1	24.7	39.9	52.5	22.8	26.9	16.6	2.9	11.4	4.1	0.4	2.8	141.3						
935	60.3	19.1	37.5	49.0	20.6	25.6	10.1	1.5	6.9	2.2	0.2	1.4	121.6						
978	59.0	17.5	37.7	58.7	25.6	29.8	12.7	1.9	9.2	2.6	0.3	1.7	132.9						
Total	62.4	24.2	35.2	55.3	24.8	27.5	18.1	3.5	12.3	4.8	0.5	3.0	140.6						
Multi-source inventory	62.1			57.1			17.8			6			143.1						
Field inventory	1.6			2			0.7			0.4			2.3						
SE of field inventory																			
<b>Pirkanmaa</b>																			
<i>Municipality</i>																			
20	36.1	13.9	20.4	67.6	29.6	33.7	23.8	3.1	17.3	4.3	0.5	3.0	131.8						
108	38.3	15.4	21.1	75.3	33.7	37.2	23.9	2.7	17.9	4.5	0.7	3.0	142.1						
143	51.3	19.0	29.8	55.1	25.5	26.4	18.0	2.0	13.3	2.4	0.3	1.7	126.9						
177	43.2	18.2	23.2	77.4	37.4	35.8	20.4	2.7	14.9	3.0	0.4	2.0	144.0						
211	40.3	17.1	21.5	73.4	33.2	35.8	23.5	3.2	17.0	5.1	0.6	3.6	142.3						
250	64.9	18.5	42.9	23.4	9.0	12.6	18.4	1.4	13.9	2.2	0.2	1.6	108.8						
289	38.8	16.5	20.8	83.8	38.8	40.2	25.2	3.8	18.1	5.6	0.6	3.9	153.3						
303	59.4	21.2	35.5	53.8	24.2	26.4	17.5	1.8	13.0	1.9	0.2	1.3	132.7						
310	44.9	18.1	24.9	77.8	36.9	36.4	20.8	2.9	15.0	3.1	0.4	2.1	146.6						
418	34.4	15.1	17.8	88.6	40.4	43.1	23.8	3.0	17.6	5.0	0.8	3.4	151.7						
493	41.9	15.9	23.8	69.5	30.4	34.7	19.4	2.3	14.2	3.4	0.6	2.2	134.3						
506	45.3	19.6	23.8	78.0	37.2	36.5	26.1	3.2	19.0	3.9	0.4	2.8	153.3						
536	39.1	16.5	20.7	76.1	33.8	37.8	20.4	2.6	14.9	4.0	0.7	2.7	139.6						
562	41.3	16.9	22.6	78.5	37.0	37.1	19.6	2.7	14.1	3.8	0.5	2.6	143.1						
581	63.0	20.0	39.7	27.2	11.5	13.8	15.4	1.3	11.4	1.9	0.2	1.3	107.4						
604	34.2	15.3	17.4	81.9	36.7	40.5	23.6	2.9	17.5	5.2	0.9	3.5	144.9						
619	50.4	20.7	28.0	92.0	47.0	40.4	19.2	2.2	13.5	3.3	0.3	2.1	164.9						
635	40.0	17.9	20.8	92.6	43.5	44.0	25.4	4.2	17.8	7.3	1.2	5.0	165.2						
702	52.0	22.0	27.9	76.6	37.0	35.7	18.2	2.4	13.3	2.8	0.3	1.9	149.6						
837	39.6	16.5	21.3	83.7	39.5	39.6	22.0	2.8	16.3	4.5	0.7	3.0	149.7						
887	45.1	18.8	24.4	80.8	39.1	37.3	20.8	2.8	15.0	3.2	0.5	2.2	149.9						

908	Valkeakoski	36.1	15.5	19.2	81.4	36.6	39.8	25.1	3.5	18.1	5.5	0.6	3.9	148.1
912	Vammala	45.3	17.1	25.9	68.0	30.9	33.0	19.1	2.3	13.9	3.0	0.5	2.0	135.3
922	Vesilähti	40.6	18.2	20.7	92.9	46.5	41.7	18.6	2.5	13.6	3.3	0.5	2.2	155.3
933	Vilppula	50.3	22.2	26.0	75.6	36.7	34.9	21.1	2.8	15.3	3.2	0.4	2.2	150.1
936	Virrat	59.2	19.4	36.6	39.4	17.3	19.6	16.1	1.5	11.8	2.4	0.2	1.7	117.0
980	Ylöjärvi	40.6	16.5	22.2	76.3	36.0	36.0	21.8	2.6	16.1	4.1	0.6	2.7	142.7
988	Äetsä	48.6	17.2	28.9	58.8	26.0	29.0	17.1	2.0	12.4	2.6	0.4	1.7	127.0
Total														
	Multi-source inventory	48.3	18.5	27.5	66.3	30.8	31.8	19.7	2.4	14.4	3.4	0.5	2.3	137.7
	Field inventory	48.3			64.7			20.1			4.8			137.8
	SE of field inventory	1.2			1.8			0.7			0.4			2.1
<b>Etelä-Savo</b>														
<i>Municipality</i>														
46	Enonkoski	54.4	25.8	26.6	56.5	24.4	28.4	19.3	3.9	12.9	6.5	0.5	3.7	136.6
90	Heinävesi	46.4	14.6	29.7	58.7	28.2	27.0	15.6	2.8	10.4	5.0	0.5	2.7	125.8
97	Hirvensalmi	63.6	30.3	31.1	41.0	17.2	21.6	27.6	6.3	18.1	9.0	1.0	5.6	141.3
171	Joroinen	47.2	19.7	25.2	64.1	34.1	27.0	18.7	3.7	12.2	5.7	0.4	3.5	135.7
178	Juva	57.4	25.5	29.5	56.4	28.3	25.3	20.1	4.2	13.2	5.3	0.4	3.2	139.2
213	Kangasniemi	56.6	26.5	27.9	52.9	26.6	23.7	20.1	4.4	13.0	5.3	0.4	3.3	134.9
246	Kerimäki	61.7	26.0	33.2	43.7	17.1	23.9	21.3	3.7	14.5	5.7	0.3	3.5	132.3
491	Mikkeli	57.7	28.0	27.7	50.0	23.7	23.8	23.2	5.3	15.2	6.7	0.6	4.0	137.6
507	Mäntyharju	70.4	31.5	36.0	33.6	13.5	18.0	20.0	3.8	13.5	4.4	0.3	2.5	128.5
588	Pertunmaa	44.2	21.5	21.3	52.0	24.4	25.0	29.1	6.4	19.7	7.1	0.7	4.3	132.4
593	Pieksämäki	52.5	20.2	29.7	52.6	26.9	22.8	19.0	3.3	12.8	4.4	0.3	2.6	128.4
618	Punkaharju	74.9	36.3	35.7	43.9	19.2	22.4	20.3	3.8	13.4	5.2	0.1	3.0	144.2
623	Puumala	86.6	38.6	44.1	21.6	8.2	12.2	22.1	4.4	15.2	3.4	0.1	1.7	133.7
681	Rantasalmi	50.4	21.7	26.7	53.4	24.9	25.7	18.9	3.5	12.7	7.5	0.5	4.0	130.2
696	Ristina	69.2	32.9	33.7	39.8	16.6	21.0	23.6	5.0	15.8	5.8	0.4	3.3	138.3
740	Savonlinna	68.0	29.5	35.9	38.5	15.1	21.3	21.8	3.7	15.0	6.2	0.1	3.6	134.5
741	Savonranta	49.5	21.5	26.1	55.4	23.5	28.2	19.4	4.5	12.5	6.2	0.4	3.6	130.4
768	Sulkava	67.9	29.3	35.7	40.5	18.0	20.4	19.1	3.6	12.8	5.0	0.1	2.7	132.4
Total														
	Multi-source inventory	59.8	26.3	31.1	47.7	22.2	22.9	20.7	4.1	13.8	5.6	0.4	3.2	133.8
	Field inventory	60.4			49.1			21.9			6.4			137.8
	SE of field inventory	1.4			1.4			0.7			0.4			1.9

(continued)

Table 7a (continued)

	Pine						Spruce			Birch			Other deciduous tree species			All tree species			
	Total		Pulpwood		Logs		Total		Pulpwood		Logs		Total		Pulpwood		Logs		
	Logs	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Total	Pulpwood	Logs	Pulpwood	Logs	Pulpwood	Total	Pulpwood	Logs		Pulpwood	Logs	Pulpwood
(m <sup>3</sup> /ha)																			
<b>Etelä-Pohjanmaa</b>																			
<i>Municipality</i>																			
4	50.3	11.7	34.8	19.0	5.6	11.9	13.5	0.7	10.1	1.8	0.1	1.4	84.5						
5	63.4	19.4	39.5	14.1	5.8	7.4	14.1	0.6	10.4	1.4	0.1	0.9	92.9						
10	67.2	22.1	40.7	17.1	7.2	8.9	13.1	0.6	9.7	1.2	0.1	0.8	98.5						
52	54.5	13.9	36.7	22.8	8.8	12.9	14.2	0.8	10.7	1.5	0.1	1.1	93.0						
74	50.9	9.7	36.3	5.5	1.7	3.0	14.6	0.5	10.7	2.2	0.1	1.5	73.2						
95	55.8	11.8	39.6	23.4	7.8	13.9	20.5	0.5	16.0	2.0	0.1	1.5	101.6						
145	47.6	15.3	29.3	43.4	19.3	22.0	13.0	1.0	9.1	2.5	0.7	1.5	106.6						
151	50.0	14.4	32.0	35.9	14.6	19.4	15.7	0.8	12.2	2.4	0.3	1.8	104.0						
152	37.6	8.8	25.3	37.2	14.2	20.4	16.8	1.3	12.0	3.1	0.3	2.2	94.7						
164	60.3	17.3	39.1	23.5	10.1	12.0	13.6	0.6	10.0	1.6	0.1	1.2	99.0						
175	44.3	14.9	26.7	44.7	17.7	24.6	15.9	1.0	12.1	2.3	0.3	1.7	107.3						
217	52.4	11.5	36.7	16.5	5.6	9.6	22.5	0.5	17.5	1.7	0.1	1.2	93.0						
218	48.7	15.5	30.3	39.0	14.0	22.9	14.0	0.7	10.5	1.8	0.2	1.3	103.6						
232	51.1	12.4	34.8	19.0	7.3	10.6	10.4	0.4	8.0	1.2	0.1	0.9	81.6						
233	57.8	16.2	37.6	21.1	8.2	11.7	14.0	0.8	10.5	1.4	0.1	1.0	94.2						
236	53.0	12.2	36.2	12.2	4.5	6.9	16.4	0.4	12.3	1.1	0.0	0.8	82.7						
281	53.7	13.1	36.5	20.1	7.3	11.6	13.4	0.6	10.1	1.4	0.1	1.1	88.6						
300	67.7	25.0	38.7	23.4	10.1	12.1	11.9	0.7	8.6	0.9	0.1	0.6	103.8						
301	52.6	18.5	31.2	33.4	14.1	17.4	12.1	0.5	8.9	1.7	0.2	1.2	99.7						
315	51.8	11.6	36.0	17.9	6.4	10.4	18.5	0.5	14.1	1.5	0.0	1.1	89.7						
399	40.2	11.8	25.6	43.4	17.5	23.2	19.3	1.2	14.0	3.3	0.3	2.5	106.1						
403	58.4	15.3	39.1	19.6	7.6	10.9	17.0	0.8	13.0	1.5	0.1	1.1	96.5						
408	56.6	17.5	35.3	26.8	11.1	14.3	15.4	0.9	11.2	2.2	0.1	1.5	100.8						
414	65.2	23.1	38.4	16.0	6.7	8.4	12.5	0.5	9.2	1.1	0.1	0.8	94.8						
421	54.4	13.2	36.5	12.6	5.1	6.5	14.9	0.6	10.9	2.3	0.0	1.5	84.2						
429	51.0	11.1	35.7	17.7	5.9	10.5	17.0	0.5	13.0	1.5	0.0	1.2	87.1						
544	52.8	16.4	32.9	23.4	9.8	12.3	13.5	0.5	9.7	1.6	0.1	1.2	91.3						
584	50.7	9.2	36.4	5.3	1.8	2.9	9.0	0.3	6.2	2.0	0.1	1.3	67.0						
743	56.1	15.1	36.7	17.4	7.2	9.0	15.5	0.7	11.4	1.8	0.2	1.2	90.9						



759	Soimi	65.2	20.1	40.6	18.9	8.1	9.7	13.1	0.6	9.6	1.4	0.1	0.9	98.6
846	Teuva	45.7	15.4	27.7	39.9	15.6	22.2	13.7	0.7	10.4	1.7	0.2	1.2	101.0
849	Toholampi	55.2	14.4	36.7	15.8	6.5	8.2	20.3	0.7	15.3	2.9	0.0	2.1	94.1
863	Töysä	71.5	26.8	40.5	23.9	11.0	11.6	10.0	0.6	7.1	0.9	0.0	0.5	106.2
885	Ullava	59.0	14.1	40.2	13.4	6.0	6.7	17.2	0.5	12.9	2.2	0.0	1.6	91.8
924	Veteli	55.3	13.5	37.3	18.2	7.3	9.9	17.7	0.7	13.5	2.5	0.2	1.7	93.7
934	Vimpeli	57.6	15.2	37.9	16.3	6.7	8.6	16.6	0.8	12.5	2.1	0.2	1.4	92.6
942	Vähäkyrö	29.4	8.1	19.3	44.2	15.2	26.1	18.6	1.5	13.1	7.5	0.4	6.0	99.7
971	Ylihärmä	46.5	11.1	31.8	26.4	8.7	16.2	16.1	1.3	11.9	2.6	0.2	2.1	91.6
975	Ylistaro	42.6	13.0	26.4	36.0	14.0	19.7	15.8	1.2	11.2	2.3	0.3	1.6	96.7
989	Ähtäri	60.6	19.5	37.2	26.3	12.2	12.6	12.5	1.0	8.9	1.5	0.1	0.9	100.9
Total														
	Multi-source inventory	54.6	15.3	35.3	22.9	9.2	12.4	14.6	0.7	10.9	1.8	0.1	1.3	93.9
	Field inventory	54.3			23.2			15.6			2.5			95.5
	SE of field inventory	1.1			1			0.5			0.2			1.4
<b>Keski-Suomi</b>														
<i>Municipality</i>														
77	Hankasalmi	42.3	17.8	22.5	71.8	36.3	32.6	18.5	3.7	12.4	6.0	0.2	3.7	138.6
172	Joutsa	38.0	15.4	20.8	71.4	33.8	34.3	22.4	4.3	15.0	9.3	0.4	5.9	141.1
179	Jyväskylä	40.8	15.8	22.8	65.8	32.0	30.8	18.4	3.4	12.3	7.5	0.3	4.8	132.5
180	Jyväskylän mlk	44.5	17.6	24.6	66.5	32.5	31.2	17.5	3.4	11.5	5.8	0.3	3.7	134.3
182	Jämsä	45.5	18.7	24.7	71.5	34.8	33.3	18.3	3.0	12.7	4.7	0.3	3.0	140.1
183	Jämsänkoski	47.1	17.8	26.8	56.1	26.6	26.7	15.4	2.5	10.2	4.7	0.2	2.9	123.3
216	Kannonkoski	54.8	17.1	34.4	38.7	16.9	19.5	13.8	1.5	9.6	2.8	0.1	1.6	110.1
226	Karstula	55.1	14.7	36.5	27.1	11.8	13.7	12.9	1.1	9.0	2.2	0.1	1.2	97.2
249	Keuruu	52.7	18.7	31.0	42.6	20.3	20.0	12.9	1.3	8.9	2.1	0.0	1.2	110.2
256	Kinnula	49.7	12.7	33.3	20.8	8.2	11.0	12.7	0.8	9.1	2.1	0.1	1.1	85.2
265	Kivijärvi	55.6	16.2	35.8	29.0	12.5	14.7	12.1	1.1	8.5	2.2	0.1	1.2	98.8
275	Konnevesi	43.7	17.6	23.8	63.2	30.6	29.8	16.8	3.1	11.3	5.0	0.2	3.1	128.7
277	Korpilahti	42.4	16.8	23.4	67.2	32.5	31.8	17.5	3.3	11.5	6.4	0.3	4.1	133.5
291	Kuhmoinen	45.1	18.8	24.1	70.5	35.3	32.1	15.5	3.0	10.1	6.0	0.4	3.9	137.2
312	Kyyjärvi	54.1	13.4	36.5	16.5	6.4	9.0	10.8	0.6	7.7	1.6	0.1	0.9	83.0
410	Laukaa	45.7	18.5	25.0	64.2	31.2	30.3	16.8	3.2	11.2	5.5	0.3	3.4	132.2
415	Leivonmäki	48.8	18.0	28.4	61.2	28.2	30.2	17.4	3.3	11.4	4.7	0.3	3.1	132.1
435	Luhanka	40.2	15.8	22.4	64.3	30.3	31.0	20.6	3.8	13.7	8.3	0.4	5.3	133.3

(continued)

Table 7a (continued)

	Pine						Spruce			Birch			Other deciduous tree species			All tree species	
	Logs		Pulpwood		Total	Logs	Pulpwood		Total	Logs		Pulpwood		Total	Logs		Pulpwood
	(m <sup>3</sup> /ha)																
495	53.8	16.0	34.5	35.0	16.1	17.1	13.2	1.4	9.1	2.1	0.1	1.3	104.1				
500	40.2	15.9	22.2	66.3	32.1	31.3	17.1	3.1	11.4	6.7	0.3	4.2	130.4				
592	48.0	16.9	28.5	52.4	24.8	25.1	15.0	2.5	9.9	4.3	0.2	2.7	119.7				
601	50.9	14.0	33.4	32.4	13.7	16.6	14.2	1.2	10.1	2.9	0.1	1.7	100.5				
633	53.6	15.6	34.6	31.0	13.9	15.3	13.3	1.3	9.2	2.2	0.1	1.3	100.0				
729	51.9	17.9	31.1	47.1	22.0	22.9	15.3	2.2	10.4	3.4	0.2	2.0	117.6				
850	45.6	18.3	25.1	62.4	29.4	30.2	18.5	3.6	12.3	5.9	0.3	3.8	132.4				
892	51.6	18.2	30.5	51.2	24.5	24.4	14.4	2.5	9.4	3.8	0.2	2.4	120.9				
931	46.1	15.7	27.6	47.3	21.4	23.4	15.5	2.0	10.8	4.2	0.2	2.6	113.1				
992	51.4	19.2	29.3	54.2	24.6	26.9	16.0	2.8	10.8	4.3	0.2	2.6	125.8				
Total	48.7	16.9	29.0	50.1	23.5	24.1	15.5	2.3	10.5	4.1	0.2	2.5	118.4				
Multi-source inventory	49.5			49.3			16.2			4.2			119.3				
Field inventory	1.1			1.5			0.5			0.3			1.8				
SE of field inventory																	
<b>Pohjois-Savo</b>																	
<i>Municipality</i>																	
140	31.9	9.6	20.3	56.3	26.7	26.7	17.7	1.6	12.8	5.4	0.2	3.2	111.3				
174	36.5	14.1	20.5	63.1	33.1	27.3	17.0	2.3	12.0	7.1	0.2	4.4	123.7				
204	45.9	18.9	24.8	59.1	31.1	25.3	15.8	2.4	11.1	5.7	0.1	3.5	126.5				
227	37.6	15.0	20.5	62.0	31.3	27.9	19.7	3.2	13.7	7.2	0.3	4.6	126.5				
239	44.8	14.7	27.3	46.4	21.6	22.2	17.1	1.9	12.3	4.1	0.2	2.6	112.4				
263	36.6	9.2	24.8	36.2	14.9	18.7	18.7	1.1	13.6	4.0	0.2	2.5	95.9				
297	36.8	16.3	18.7	71.7	38.1	30.6	19.2	3.5	13.3	8.2	0.3	5.2	135.9				
402	34.0	10.5	21.5	60.0	29.6	27.4	18.3	1.8	13.2	5.5	0.2	3.3	117.8				
420	39.2	18.1	19.3	77.7	42.0	32.4	20.2	4.0	13.8	7.9	0.3	5.1	145.0				
476	33.7	12.1	19.8	72.9	37.0	32.6	18.0	2.4	12.8	6.8	0.3	4.2	131.4				
534	33.4	11.6	20.0	65.1	33.8	28.4	18.1	2.1	12.9	7.0	0.3	4.2	123.6				
595	39.0	12.2	24.4	51.9	24.1	24.9	17.6	1.8	12.6	5.1	0.2	3.1	113.6				
686	42.7	17.4	23.0	56.5	27.0	26.8	18.5	3.3	12.7	6.3	0.2	4.0	124.0				
687	42.6	11.1	28.7	34.7	14.7	17.8	17.2	1.2	12.4	3.5	0.1	2.2	98.0				
749	30.7	12.0	17.1	66.6	34.5	29.2	17.3	2.5	12.1	7.6	0.3	4.7	122.2				

762	Sonkajärvi	38.7	9.6	26.4	34.3	14.2	17.8	17.2	1.0	12.5	3.2	0.1	1.9	93.4
778	Suonenjoki	43.4	18.8	22.5	66.3	34.0	29.5	17.8	3.3	12.2	5.7	0.2	3.6	133.3
844	Tervo	38.5	14.8	21.6	59.4	28.8	27.7	17.8	2.9	12.4	6.6	0.3	4.1	122.3
857	Tuusniemi	35.2	15.5	17.9	62.5	33.1	26.5	17.9	3.2	12.2	7.5	0.2	4.7	123.1
915	Varkaus	49.7	21.2	26.6	64.0	32.3	28.7	18.1	4.1	11.6	6.3	0.4	3.4	138.1
916	Varpaisjärvi	34.8	10.9	21.8	56.2	27.5	25.9	18.2	1.7	13.1	5.4	0.2	3.2	114.7
921	Vesanto	42.2	15.6	24.2	55.0	25.8	26.5	17.3	2.8	11.9	5.0	0.2	3.1	119.4
925	Vieremä	38.0	9.9	25.5	34.3	14.0	17.9	18.2	1.1	13.2	3.3	0.1	1.9	93.8
Total														
	Multi-source inventory	38.6	13.4	22.9	54.6	26.7	25.1	18.0	2.3	12.7	5.6	0.2	3.4	116.8
	Field inventory	37.3			53.2			19.0			6.8			116.2
	SE of field inventory	1.0			1.5			0.6			0.4			1.7
<b>Pohjois-Karjala</b>														
<i>Municipality</i>														
45	Eno	47.6	16.5	28.4	35.2	15.8	17.2	17.1	2.6	12.0	2.9	0.1	1.4	102.7
146	Ilomantsi	61.0	16.4	40.3	19.7	7.7	10.6	11.1	0.9	7.3	1.8	0.0	0.9	93.5
167	Joensuu	49.2	16.2	30.8	45.2	19.9	23.1	17.3	2.5	11.9	3.2	0.1	1.5	114.9
176	Juuka	52.9	14.6	35.3	32.7	14.5	16.1	13.9	1.3	9.7	3.7	0.1	2.0	103.2
248	Kesälahti	69.7	27.2	38.9	25.1	9.2	14.3	17.6	2.4	12.1	5.2	0.1	2.8	117.5
260	Kitee	57.1	21.0	33.1	41.1	17.7	20.8	19.2	2.8	12.9	4.4	0.1	1.7	121.8
276	Kontiolahti	64.9	27.3	34.5	30.1	13.3	15.0	18.8	1.7	13.8	4.0	0.1	2.1	117.7
309	Ourokumpu	61.1	24.2	34.3	39.4	14.9	22.0	21.2	2.3	16.1	8.4	0.1	4.6	130.1
422	Liekka	60.6	17.8	39.1	21.1	8.8	10.8	13.0	1.2	8.7	2.2	0.1	1.2	97.0
426	Liperi	56.0	19.9	33.6	41.2	17.1	21.5	18.9	3.0	13.1	5.8	0.4	3.5	121.9
541	Nurmes	42.7	11.4	28.4	30.9	12.6	16.3	15.1	1.4	10.3	3.4	0.1	1.9	92.1
607	Polvijärvi	56.9	16.4	38.0	32.3	13.0	17.2	18.9	2.0	13.8	6.8	0.1	4.0	114.8
632	Pyhäselkä	37.1	14.2	21.3	54.4	23.8	28.0	22.7	3.3	15.9	6.0	0.0	4.0	120.2
707	Rääkkylä	54.8	20.7	32.3	43.2	20.3	20.9	26.0	3.3	18.4	5.8	0.2	3.3	129.8
848	Tohmajärvi	56.4	18.9	35.1	40.7	19.0	19.6	13.7	2.1	8.7	3.5	0.1	1.7	114.2
911	Valtimo	38.9	9.4	26.8	27.4	10.5	15.1	14.7	1.4	10.0	3.7	0.0	1.9	84.6
Total														
	Multi-source inventory	55.1	17.2	34.8	30.5	12.9	15.7	15.4	1.7	10.6	3.5	0.1	1.8	104.5
	Field inventory	52.9			31.5			16.1			4.0			104.6
	SE of field inventory	1.2			1.1			0.5			0.3			1.4

(continued)

Table 7a (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	Total	Logs	Pulpwood	
	(m <sup>3</sup> /ha)												
<b>Kainuu</b>													
<i>Municipality</i>													
105	44.8	12.1	29.7	20.8	7.1	12.1	11.9	0.3	8.2	1.2	0.1	0.7	78.7
205	53.5	11.6	38.0	9.8	2.8	5.9	15.7	0.2	11.2	1.8	0.1	1.2	80.8
290	54.6	17.0	34.1	17.6	5.4	10.7	10.4	0.3	6.8	1.2	0.0	0.6	83.8
578	46.2	11.5	32.1	21.8	7.5	12.8	15.6	0.5	11.3	1.9	0.1	1.1	85.6
620	40.4	10.4	27.1	20.8	7.0	12.4	10.9	0.3	7.8	1.1	0.0	0.6	73.2
697	40.6	10.9	27.2	25.1	8.5	14.7	14.5	0.5	10.4	1.6	0.0	0.8	81.8
765	46.4	10.9	32.6	22.2	7.4	13.0	14.5	0.4	10.1	2.0	0.1	1.1	85.1
777	45.5	13.5	28.8	17.1	5.1	10.6	8.9	0.2	6.1	0.9	0.0	0.6	72.4
785	55.8	13.2	38.2	3.9	1.3	2.2	12.8	0.2	9.0	1.3	0.1	1.0	73.8
Total													
	48.1	13.1	31.7	17.8	5.7	10.7	11.7	0.3	8.1	1.3	0.1	0.8	78.9
Multi-source inventory	47.1			18.6			12.3			1.4			79.4
Field inventory	0.9			0.8			0.3			0.1			1.3
SE of field inventory													
<b>Pohjois-Pohjanmaa</b>													
<i>Municipality</i>													
9	52.7	10.7	38.3	17.8	5.7	10.6	15.2	0.4	11.3	2.6	0.2	1.6	88.3
69	52.5	12.5	36.3	22.3	7.4	13.1	19.4	0.8	14.4	4.1	0.1	2.7	98.2
71	48.2	11.6	33.5	17.5	4.6	11.2	26.4	0.5	20.4	4.7	0.1	3.5	96.9
72	51.9	12.4	34.7	6.1	1.9	3.8	15.6	0.1	10.7	2.9	0.1	2.1	76.4
84	46.3	10.0	32.6	16.6	4.6	10.6	16.5	0.3	12.4	2.3	0.1	1.5	81.7
139	41.4	8.5	29.4	14.5	3.3	9.8	21.0	0.2	15.8	2.9	0.2	2.0	79.7
208	49.4	8.6	36.9	11.8	2.6	7.9	15.9	0.3	11.9	1.6	0.1	0.9	78.7
244	46.8	9.6	33.0	9.4	2.4	6.3	18.9	0.2	13.3	3.0	0.1	2.3	78.1
247	55.9	10.4	40.7	4.8	1.1	3.1	18.0	0.2	12.8	1.9	0.1	1.4	80.6
255	53.2	10.6	38.4	17.5	4.5	11.5	14.2	0.2	10.3	1.6	0.1	1.0	86.5
305	41.1	11.1	27.2	18.6	5.4	11.8	7.7	0.1	5.6	1.3	0.0	0.7	68.6
317	51.7	10.9	37.2	14.8	4.0	9.4	23.8	0.5	17.4	5.3	0.2	4.1	95.5
425	46.3	6.7	34.8	3.8	1.1	2.4	20.4	0.2	14.1	2.4	0.2	1.9	73.0
436	44.9	8.5	32.4	7.9	2.1	5.3	24.5	0.1	16.9	3.8	0.2	3.0	81.1

483	Merijärvi	50.0	9.9	36.9	23.0	6.9	14.2	19.7	0.3	15.5	3.6	0.1	2.6	96.3
494	Muhos	52.1	11.0	36.4	6.1	1.6	3.9	13.6	0.1	9.6	1.6	0.1	1.2	73.3
535	Nivala	48.6	12.5	33.0	26.7	9.4	15.5	18.6	0.5	14.4	3.8	0.1	2.6	97.6
563	Oulainen	43.0	9.8	30.4	22.5	7.5	13.4	20.5	0.3	16.4	4.1	0.1	3.1	90.2
564	Oulu	54.2	12.1	38.1	17.5	4.6	11.5	17.5	0.2	13.1	2.8	0.2	1.9	92.0
567	Oulunsalo	51.0	10.4	36.1	13.2	3.0	8.9	17.1	0.1	12.5	2.5	0.1	1.8	83.8
603	Piippola	54.1	10.1	39.8	8.1	1.9	5.3	21.4	0.2	15.6	2.9	0.2	2.1	86.5
615	Pudasjärvi	44.9	7.6	33.4	12.3	3.1	8.1	9.4	0.1	6.7	1.1	0.0	0.6	67.7
617	Pulkkiila	56.2	10.4	41.5	10.5	2.8	6.8	22.4	0.3	16.4	3.3	0.2	2.4	92.4
625	Pyhäjoki	43.9	8.1	32.5	15.1	3.7	9.9	21.5	0.4	16.6	3.6	0.3	2.3	84.1
626	Pyhäsalmi	48.6	9.9	35.4	18.6	5.7	11.3	19.6	0.5	14.5	2.9	0.1	1.8	89.6
630	Pyhäntä	59.1	11.9	42.8	6.4	1.6	4.1	16.4	0.2	11.6	1.9	0.1	1.4	83.8
678	Raahе	47.3	10.2	33.2	16.6	4.9	10.4	19.2	0.2	13.8	4.6	0.4	3.1	90.1
682	Ranisla	52.8	8.8	39.1	6.5	1.6	4.2	21.2	0.2	9.8	2.3	0.1	1.7	80.7
691	Reisjärvi	58.4	11.6	41.9	12.6	4.6	6.9	14.0	0.6	9.8	2.8	0.1	1.4	87.7
746	Sievi	55.8	12.1	39.5	10.4	3.7	5.9	14.2	0.5	10.2	2.1	0.1	1.1	82.5
748	Sirkajoki	49.6	9.3	35.8	8.7	2.2	5.8	19.7	0.1	14.1	2.9	0.1	2.2	80.9
832	Taivalkoski	40.7	9.4	28.6	20.6	6.1	13.2	9.2	0.2	6.4	1.4	0.0	0.9	71.9
859	Tyrmävä	49.4	7.4	36.8	3.3	0.9	2.1	16.6	0.2	11.5	1.5	0.1	1.2	70.8
889	Utajärvi	57.3	11.3	40.8	5.7	1.3	3.7	11.7	0.2	8.6	1.2	0.1	0.9	75.8
926	Vihanti	50.7	9.9	36.6	13.0	3.7	8.2	19.7	0.2	14.8	3.2	0.2	2.2	86.7
972	Yli-Ii	46.2	8.4	33.6	10.1	1.9	7.0	14.1	0.1	10.2	1.4	0.1	0.9	71.7
973	Ylikinninki	55.7	10.4	40.3	11.5	2.6	7.7	14.2	0.1	10.4	1.4	0.1	1.1	82.8
977	Ylivieska	46.1	9.9	32.8	19.5	6.8	11.3	17.8	0.4	13.7	3.4	0.1	2.4	86.8
Total														
	Multi-source inventory	47.6	9.9	34.0	14.1	4.0	9.0	14.7	0.2	10.8	2.2	0.1	1.5	78.7
	Field inventory	47.1			15.9			15.5			2.4			80.8
	SE of field inventory	0.8			0.7			0.4			0.2			1.0
<b>Lapland</b>														
<i>Municipality</i>														
47	Enontekiö	42.5	8.5	32.1	3.4	0.9	2.3	8.8	0.0	4.2	0.2	0.0	0.0	54.9
148	Inari	55.3	9.5	42.8	3.5	1.0	2.4	5.6	0.0	3.1	0.1	0.0	0.0	64.5
240	Kemi	15.8	1.7	12.5	29.1	9.9	17.1	22.9	0.2	16.9	2.4	0.0	1.6	70.3
241	Keminmaa	19.1	3.0	14.2	27.4	7.3	17.5	25.1	0.3	18.4	1.9	0.0	1.3	73.4
261	Kittilä	30.6	6.2	22.3	11.9	2.5	8.3	11.3	0.1	8.0	0.5	0.0	0.3	54.3

(continued)

Table 7a (continued)

	Pine						Spruce			Birch			Other deciduous tree species			All tree species			
	Total		Logs		Pulpwood		Total		Logs		Pulpwood		Total		Logs		Pulpwood		
	(m <sup>3</sup> /ha)																		
273	39.8	9.1	27.6	10.6	1.3	7.8	10.2	0.1	7.2	0.7	0.0	0.4	61.3						
320	43.9	8.4	32.0	7.9	1.3	5.7	7.6	0.0	5.1	0.4	0.0	0.2	59.9						
498	48.3	13.6	32.5	9.7	2.3	6.5	6.9	0.0	4.5	0.4	0.0	0.2	65.2						
583	36.0	6.1	26.9	10.7	1.7	7.7	11.8	0.0	7.6	0.9	0.1	0.5	59.4						
614	44.0	9.4	31.6	13.3	3.2	9.1	6.3	0.1	4.5	0.7	0.0	0.3	64.2						
683	36.9	5.5	27.8	8.9	1.1	6.5	8.0	0.0	5.2	0.6	0.0	0.3	54.3						
698	39.1	7.2	28.4	10.9	1.3	8.2	8.2	0.1	5.8	0.7	0.0	0.4	58.9						
732	35.8	6.9	26.4	16.3	4.0	10.9	9.2	0.1	6.5	0.9	0.1	0.5	62.2						
742	40.3	7.9	29.8	11.3	3.0	7.4	6.5	0.1	4.6	0.3	0.0	0.1	58.4						
751	33.5	7.0	22.7	14.6	2.7	10.2	22.3	0.2	16.3	1.3	0.0	0.9	71.7						
758	35.2	7.4	25.7	10.2	2.5	7.1	8.5	0.0	5.8	0.2	0.0	0.1	54.1						
845	26.2	3.6	19.9	23.6	4.0	16.7	17.4	0.2	12.3	1.4	0.1	0.9	68.6						
851	17.5	2.2	13.5	28.3	6.7	19.1	24.0	0.4	17.2	2.0	0.0	1.4	71.8						
854	35.8	7.4	25.1	12.1	1.5	8.9	11.1	0.1	7.7	1.0	0.0	0.6	60.0						
890	40.6	1.1	33.6	3.9	0.8	2.9	9.4	0.0	2.8	0.0	0.0	0.0	53.9						
976	33.8	6.2	23.7	12.6	1.5	9.3	15.0	0.1	10.5	0.9	0.0	0.6	62.3						
Total																			
	39.4	7.6	29.0	10.9	2.2	7.6	9.3	0.1	6.3	0.6	0.0	0.3	60.0						
Multi-source inventory																			
Field inventory	39.1			11.8			9.6			0.6			61.1						
SE of field inventory	0.8			0.5			0.3			0.1			0.8						

**Table 7b** The growing stock volume by tree species and roundwood assortment on forest land (By forestry centres).

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Pulp-wood		Total	Pulp-wood		Total	Pulp-wood		Total	Pulp-wood		Total	
	Logs	wood		Logs	wood		Logs	wood		Logs	wood		
(1,000 m <sup>3</sup> )													
<b>Åland</b>													
<i>Municipality</i>													
35 Brändö	100	4	91	4	1	4	79	0	67	84	1	53	267
43 Eckerö	437	57	368	222	56	146	99	3	81	48	1	39	806
60 Finström	455	59	384	255	66	169	117	4	96	71	1	56	898
62 Föglö	476	62	399	193	50	128	91	2	73	84	2	56	843
65 Geta	266	32	227	124	30	83	49	2	39	25	0	19	463
76 Hammarland	521	65	441	273	68	182	134	4	110	76	2	62	1,005
170 Jomala	569	77	476	319	82	212	139	5	113	88	2	70	1,115
295 Kumlinge	198	22	168	43	9	31	64	1	53	68	2	47	373
318 Kökar	44	7	35	9	1	8	31	0	24	38	1	25	121
417 Lemland	446	59	375	257	67	169	129	4	106	81	3	64	914
438 Lumparland	139	18	117	65	16	43	25	1	20	16	0	12	246
478 Mariehamn	28	3	24	12	3	8	7	0	6	6	0	4	53
736 Saltvik	534	68	452	262	66	176	94	3	77	51	1	40	942
766 Sottunga	44	5	37	14	3	9	16	0	13	16	0	11	90
771 Sund	402	52	339	202	49	136	87	3	70	53	2	41	744
941 Vårdö	295	37	250	129	31	87	53	1	43	36	1	26	513
<b>Total</b>													
Multi-source inventory	4,956	629	4,183	2,383	599	1,592	1,213	33	991	839	19	624	9,392
Field inventory	4,291			2,035			1,068			910			8,303
SE of field inventory	276			205			92			126			481

(continued)

Table 7b (continued)

	Pine				Spruce				Birch				Other deciduous tree species				All tree species
	Pulp-wood		Total		Pulp-wood		Total		Pulp-wood		Total		Pulp-wood		Total		
	Logs	wood	Logs	wood	Logs	wood	Logs	wood	Logs	wood	Logs	wood	Logs	wood	Logs	wood	
	(1,000m <sup>3</sup> )																
<b>Rannikko/Etelärannikko</b>																	
<i>Municipality</i>																	
40	1,231	411	769	670	265	373	177	31	126	78	9	43	2,155				
49	750	336	391	1,086	557	472	443	131	270	238	42	145	2,517				
78	534	170	350	211	65	133	152	24	112	49	16	28	947				
91	216	85	123	323	150	152	229	61	137	128	17	80	895				
92	328	130	184	721	327	351	355	93	218	187	21	126	1,592				
101	584	165	393	206	75	121	38	6	25	30	8	21	858				
149	1,078	465	578	1,316	654	599	430	131	265	126	48	59	2,950				
150	356	132	212	116	40	69	24	3	18	24	7	16	520				
220	602	224	356	717	324	356	297	79	194	96	28	52	1,713				
235	11	4	6	12	6	5	6	2	4	3	0	2	32				
243	1,346	529	766	796	349	408	210	41	139	75	13	45	2,428				
257	993	453	511	1,306	699	542	494	146	304	222	57	119	3,015				
279	668	193	445	245	93	140	61	8	44	39	5	30	1,014				
407	652	251	373	1,530	656	794	401	75	281	87	13	54	2,669				
424	231	87	134	483	206	251	123	23	86	29	5	18	866				
434	162	60	95	196	84	101	60	11	45	12	1	8	430				
533	1,054	295	714	414	142	251	174	17	138	62	2	44	1,704				
573	1,063	373	644	490	192	272	201	34	141	88	9	54	1,843				
585	1,200	405	740	1,866	789	974	581	97	425	146	23	99	3,793				
606	989	335	617	702	280	381	229	48	150	73	16	48	1,994				
638	1,678	547	1,067	2,856	1,191	1,500	835	161	572	299	38	222	5,668				
701	761	256	474	1,071	417	590	416	73	313	89	12	61	2,338				
753	876	329	517	1,616	721	801	551	131	353	219	25	161	3,262				



755	Siuntio-Sjundeå	617	298	300	1,112	600	459	295	80	186	142	44	68	2,166
835	Ekenäs-Tammisaari	3,064	1,029	1,929	2,008	808	1,096	698	133	471	244	57	155	6,015
923	Västana fjärd	439	169	253	260	112	135	71	15	46	21	4	12	791
<b>Total</b>														
	Multi-source inventory	21,484	7,732	12,940	22,330	9,801	11,325	7,553	1,654	5,062	2,805	522	1,769	54,172
	Field inventory	20,369			21,606			8,171			3,708			53,853
	SE of field inventory	1,105			1,298			534			350			2,132
<b>Rannikko/Pohjanmaa</b>														
<i>Municipality</i>														
231	Kaskinen-Kaskö	18	4	12	37	11	23	12	1	9	4	0	3	70
272	Kokkola-Karleby	927	206	659	711	217	451	449	22	352	66	5	44	2,152
280	Korsnäs	526	148	338	795	243	496	449	34	335	44	3	29	1,814
287	Kristinestad-Kristinankaupunki	1,879	561	1,195	2,669	826	1,691	860	70	657	159	22	108	5,567
288	Kronoby-Kruunupy	2,624	612	1,828	1,436	471	885	841	38	649	82	5	59	4,983
440	Larsmo-Luoto	398	92	279	294	93	183	177	9	135	32	2	20	901
475	Malax-Maalathi	1,087	282	717	1,381	473	812	837	59	618	128	17	89	3,432
499	Korsholm-Mustasaari	1,409	428	901	2,990	1,103	1,742	1,050	71	784	292	19	232	5,742
545	Närpes-Närpiö	2,407	739	1,524	3,459	1,108	2,156	1,235	81	926	189	18	128	7,291
559	Oravais-Oravainen	462	111	324	462	141	289	279	20	209	39	4	28	1,242
598	Jakobstad-Pietarsaari	212	41	157	156	39	103	140	8	110	20	2	14	528
599	Pedersöre-Pedersören kunta	2,607	626	1,798	1,562	462	994	993	53	771	112	9	83	5,274
893	Nykarleby-Uusikaarlepyy	1,992	443	1,404	1,383	373	885	947	55	721	92	6	68	4,414
905	Väasa-Väsa	289	93	181	627	218	380	214	18	165	58	3	47	1,188
945	Vörå-Maxmo-Vöyri-Maksamaa	1,280	319	882	1,944	681	1,139	857	78	620	211	18	158	4,292
<b>Total</b>														
	Multi-source inventory	18,116	4,706	12,200	19,906	6,458	12,230	9,340	615	7,061	1,528	133	1,111	48,890
	Field inventory	17,705			21,262			8,912			1,929			49,807
	SE of field inventory	867			1,125			505			243			1,909

(continued)

Table 7b (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Total	Logs	Pulp-wood	Total	Logs	Pulp-wood	Total	Logs	Pulp-wood	Total	Logs	Pulp-wood	
<b>Lounais-Suomi</b>													
<i>Municipality</i>													
6	690	272	395	796	379	373	230	28	162	50	5	34	1,766
17	250	107	136	105	39	60	31	5	21	21	3	15	407
19	264	126	129	248	115	121	56	9	37	26	4	18	594
50	1,824	714	1,039	1,616	711	806	514	59	357	115	17	80	4,069
51	1,412	578	778	1,290	545	665	387	37	272	110	15	78	3,198
73	1,340	587	708	1,014	453	516	259	55	164	123	18	82	2,736
79	422	140	264	393	166	202	147	16	104	24	3	16	986
99	1,367	402	895	267	96	152	299	16	227	45	5	31	1,978
102	948	337	575	1,539	709	738	479	62	336	72	8	45	3,037
181	736	259	436	540	251	255	218	26	160	47	3	34	1,540
202	156	64	86	89	37	47	25	4	17	16	2	10	285
214	2,657	834	1,681	1,613	753	762	727	71	538	123	10	85	5,121
230	2,007	565	1,344	476	173	270	439	25	328	67	9	47	2,989
252	926	435	462	958	466	447	221	37	145	78	12	53	2,182
254	473	168	280	584	278	273	170	23	124	31	2	21	1,257
259	1,148	538	573	1,073	506	514	267	47	173	106	19	72	2,594
262	395	156	223	435	180	227	137	15	97	32	4	22	999
271	1,737	626	1,034	1,689	741	845	531	65	372	89	11	60	4,046
284	400	170	218	721	370	316	159	19	112	33	3	22	1,314
304	818	340	455	278	89	168	102	20	69	99	19	67	1,296
308	286	133	144	376	182	177	80	12	54	27	4	19	769
319	952	374	543	805	368	390	262	32	184	51	7	36	2,071
400	2,330	946	1,297	1,730	742	883	492	49	337	131	18	91	4,683
406	941	378	525	703	308	352	195	21	136	52	7	35	1,891

413	Lavia	1,246	459	722	1,264	560	624	447	58	328	81	6	57	3,039
419	Lemu	127	53	69	71	29	38	20	2	14	9	1	6	227
423	Lieto	661	307	333	516	242	249	108	16	71	50	8	36	1,334
430	Loimaa	908	386	492	1,620	836	707	345	40	243	75	8	48	2,948
442	Luvia	713	283	392	947	409	476	299	24	222	43	7	31	2,003
480	Maartila	541	236	287	630	300	298	160	22	108	49	7	35	1,380
481	Masku	291	121	159	203	86	106	54	6	37	25	3	17	573
482	Mellilä	184	69	109	274	138	121	72	8	50	13	1	9	543
484	Merikarvia	1,832	572	1,126	1,536	623	807	579	63	419	113	9	80	4,060
485	Merimasku	255	109	138	93	33	53	29	5	20	25	4	18	400
501	Muurila	306	145	151	249	116	121	63	11	40	26	4	18	644
503	Mynämäki	1,984	778	1,124	1,598	711	789	509	58	356	134	18	94	4,224
529	Naantali	211	89	115	87	33	49	23	4	16	16	2	11	337
531	Nakkila	444	163	262	621	269	311	213	21	156	33	5	22	1,311
537	Noormarkku	1,236	490	687	1,670	769	805	503	62	368	74	9	51	3,483
538	Nousiainen	763	328	410	675	325	315	153	21	106	37	5	25	1,628
561	Oripää	387	160	213	278	128	134	90	12	62	23	3	17	779
577	Paimio	883	388	466	555	247	286	136	25	90	58	7	38	1,632
586	Pemiö	1,782	836	889	1,399	656	678	338	63	214	131	22	92	3,651
587	Pertteli	456	217	225	427	200	206	99	16	64	42	8	29	1,024
602	Piikkiö	295	127	158	187	83	96	42	8	28	22	3	14	546
608	Pomarkku	1,272	513	703	1,740	832	815	429	55	315	67	7	46	3,508
609	Pori	1,409	534	799	1,917	825	967	631	61	459	107	14	77	4,065
631	Pyhärinta	734	314	396	531	219	279	146	17	100	47	7	33	1,458
636	Pöytyä	1,303	589	668	1,310	608	633	335	50	226	117	18	83	3,066
680	Raisio	134	57	72	79	34	40	21	3	14	13	2	8	247
684	Rauma	1,323	545	727	910	374	479	264	27	184	93	12	65	2,590
704	Rusko	154	65	83	113	49	58	27	3	19	14	2	10	309
705	Rymättylä	672	273	380	224	81	129	61	11	42	57	9	39	1,013
734	Salo	514	234	262	420	191	209	112	18	72	48	8	33	1,094
738	Sauvo	882	367	482	523	222	275	140	22	95	68	9	45	1,612
747	Siikainen	1,948	613	1,212	1,456	627	732	604	67	438	121	9	85	4,129

(continued)

Table 7b (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species	
	Total		Pulp-wood	Total		Pulp-wood	Total		Logs	Total		Logs		Pulp-wood
	Logs	Wood		Logs	Wood		Logs	Wood	Logs	Wood	Logs	Wood		
	(1,000m <sup>3</sup> )													
761	1,764	749	957	2,724	1,356	1,232	690	98	478	189	28	124	5,367	
776	674	306	346	736	371	331	167	29	111	65	10	44	1,642	
783	668	272	373	509	237	243	151	19	106	35	5	24	1,363	
784	394	177	203	319	144	160	72	16	45	40	6	26	825	
833	571	238	315	194	68	113	62	11	42	48	7	33	875	
838	284	133	141	286	130	141	65	10	42	31	5	22	666	
853	621	260	339	363	154	190	107	16	72	66	9	43	1,157	
886	1,441	536	833	1,663	713	842	588	71	428	86	9	60	3,778	
895	2,095	859	1,155	1,051	405	580	350	37	248	154	17	105	3,649	
906	283	120	153	256	122	121	66	9	46	16	2	11	622	
913	337	133	192	539	248	261	162	22	114	29	3	19	1,066	
918	689	283	380	326	127	181	105	12	74	49	5	32	1,169	
920	158	62	92	41	12	26	14	3	10	18	4	12	231	
979	1,554	618	877	1,294	596	625	410	53	287	88	12	61	3,346	
Total														
	61,859	24,410	34,886	53,764	24,191	26,492	16,489	2,039	11,608	4,309	571	2,963	13,6422	
	63,312			56,131			16,994			4,540			14,0976	
	1,715			2,022			619			391			3,215	
<b>Häme-Uusimaa</b>														
<i>Municipality</i>														
15	381	183	180	785	377	362	162	38	102	62	5	41	1,389	
16	1,797	978	758	3,560	1,864	1,533	1,015	253	649	404	52	263	6,775	
18	511	269	227	1,160	548	554	270	74	167	78	12	47	2,020	
61	577	261	297	1,265	660	542	267	45	185	33	6	23	2,143	

81	Hartola	1,805	898	855	3,344	1,576	1,616	1,286	289	875	415	48	243	6,850
82	Hattula	1,115	473	599	1,818	872	841	678	144	456	76	14	48	3,687
83	Hauho	968	491	453	2,690	1,464	1,116	473	92	331	214	28	162	4,345
86	Hausjärvi	833	359	440	1,855	1,008	769	371	79	245	125	23	70	3,183
98	Hollola	1,042	542	456	2,691	1,429	1,136	466	86	310	241	33	152	4,441
103	Humppila	278	121	149	744	371	344	164	22	123	17	2	12	1,202
106	Hyvinkää	853	346	466	1,675	903	701	388	84	255	127	20	76	3,042
109	Hämeenlinna	431	194	222	872	441	387	273	57	186	67	9	47	1,644
111	Heinola	3,191	1,616	1,443	3,226	1,474	1,597	1,347	325	861	410	40	248	8,173
165	Janakkala	1,312	598	669	3,217	1,741	1,336	717	135	497	198	35	129	5,443
169	Jokioinen	378	175	192	787	407	343	152	24	107	24	3	17	1,341
186	Järvenpää	39	16	20	121	61	54	32	6	21	18	2	9	209
210	Kalvola	921	367	515	1,780	853	831	549	98	385	38	5	26	3,288
223	Karjalohja	399	164	219	483	253	211	139	24	91	25	4	16	1,046
224	Karkkila	720	317	375	1,471	797	607	347	75	235	97	13	67	2,635
245	Kerava	44	21	21	121	54	60	37	8	24	18	1	11	221
283	Hämeenkoski	349	166	167	1,213	636	521	207	33	147	76	12	49	1,846
316	Kärkölä	449	194	233	1,371	736	578	260	54	172	87	10	52	2,166
398	Lahti	277	149	118	549	278	240	127	24	78	113	13	72	1,066
401	Lammi	1,331	634	646	3,741	1,984	1,575	667	101	485	224	33	150	5,963
433	Loppi	1,795	771	953	3,719	2,014	1,542	884	190	591	192	28	133	6,590
444	Lohja-Lojo	780	361	393	1,251	686	510	340	65	231	134	19	79	2,504
504	Myrskylä-Mörskom	534	261	253	1,066	491	514	270	67	171	69	10	40	1,938
505	Mäntsälä	1,230	539	639	3,673	1,996	1,531	616	147	394	195	27	111	5,714
532	Nastola	1,060	571	453	1,393	687	637	399	90	244	240	30	150	3,092
540	Nummi-Pusula	1,412	600	759	2,185	1,105	972	598	112	412	132	19	90	4,327
543	Nurmijärvi	665	268	362	1,554	808	675	395	86	260	199	28	126	2,812
560	Orimattila	1,303	652	594	2,794	1,458	1,194	529	115	332	238	29	145	4,864
576	Padasjoki	1,997	1,094	839	4,037	2,266	1,582	952	196	660	276	41	183	7,262
611	Pornainen	318	161	145	744	341	365	197	44	125	70	11	39	1,329
616	Pukkila	249	120	119	658	336	291	151	33	98	54	7	31	1,112
692	Renko	935	430	472	1,638	899	667	406	99	262	51	9	33	3,031

(continued)

Table 7b (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Pulp-wood		Total	Pulp-wood		Total	Pulp-wood		Total	Pulp-wood		Total	
	Logs	Wood		Logs	Wood		Logs	Wood		Logs	Wood		
	(1,000m <sup>3</sup> )												
694	250	106	134	634	352	255	141	30	93	54	11	33	1,079
737	228	96	123	276	141	123	85	15	57	17	3	10	605
781	2,438	1,273	1,089	3,895	1,856	1,854	1,553	370	1,045	553	68	355	8,438
834	2,153	893	1,181	3,440	1,758	1,497	906	157	637	107	11	80	6,606
855	395	190	192	1,158	620	485	201	33	143	66	9	46	1,820
858	354	147	188	986	498	444	240	49	156	115	15	70	1,696
927	1,471	631	779	2,694	1,418	1,145	743	168	499	363	51	245	5,272
981	374	179	186	799	397	365	165	26	116	26	3	19	1,364
Total	39,942	18,876	19,573	79,131	40,915	34,503	20,166	4,259	13,512	6,336	854	4,048	145,575
Multi-source inventory	38,413			78,980			20,667			7,915			145,976
Field inventory	1,403			2,274			744			503			3,138
<b>Kaakkois-Suomi</b>													
<i>Municipality</i>													
44	792	325	433	1,646	785	782	350	66	237	109	14	72	2,897
75	2,623	871	1,623	2,618	1,134	1,348	573	97	393	149	16	98	5,963
142	1,731	632	1,015	2,737	1,268	1,326	746	134	501	235	27	154	5,449
153	523	244	260	608	274	307	227	50	150	75	11	41	1,433
163	2,584	1,105	1,359	1,618	678	847	818	142	577	213	18	148	5,232
173	1,175	568	567	1,267	592	616	499	113	331	178	27	98	3,120
285	977	378	550	992	437	499	354	63	248	102	8	69	2,424
286	94	28	61	107	45	56	39	6	26	13	1	8	253
306	326	105	204	423	184	216	137	22	93	42	4	27	928

405	Lappeenranta	3,090	1,189	1,746	3,625	1,810	1,654	907	178	624	260	37	161	7,882
416	Lemi	1,014	455	517	996	502	449	348	77	233	107	14	67	2,466
441	Luumäki	3,702	1,237	2,270	3,585	1,640	1,767	877	162	607	191	23	129	8,355
489	Miehikkälä	1,912	571	1,225	1,824	783	940	354	53	250	76	10	50	4,166
580	Parikkala	2,272	993	1,178	1,734	689	941	827	145	557	339	18	193	5,172
624	Pyhtää-Pyttis	1,022	409	565	1,263	564	627	477	99	325	130	13	86	2,892
689	Rautjärvi	1,626	758	809	1,554	725	748	642	133	430	223	23	126	4,045
700	Ruokolahti	5,702	2,383	3,053	3,593	1,634	1,762	1,566	349	1,031	345	34	193	11,206
739	Savitaipale	3,285	1,337	1,791	1,937	889	950	909	208	598	168	11	114	6,299
754	Anjalankoski	2,689	882	1,670	2,951	1,259	1,535	705	122	484	176	23	115	6,522
775	Suomenniemi	1,995	910	995	774	329	400	486	119	316	92	6	56	3,347
831	Taipalsaari	2,146	1,009	1,053	1,134	508	565	668	153	440	180	24	103	4,129
909	Valkeala	4,325	1,570	2,536	3,331	1,445	1,707	1,057	187	722	261	24	175	8,974
935	Virolahti	1,593	504	991	1,293	544	676	268	41	183	59	6	38	3,212
978	Ylämaa	1,796	533	1,147	1,786	780	907	387	57	279	78	10	52	4,046
Total														
	Multi-source inventory	48,993	18,996	27,619	43,397	19,496	21,626	14,221	2,779	9,633	3,800	400	2,371	110,411
	Field inventory	48,444			44,529			13,921			4,692			111,585
	SE of field inventory	1,467			1,713			618			334			2,475
<b>Pirkanmaa</b>														
<i>Municipality</i>														
20	Akaa	198	77	112	372	163	185	131	17	95	24	3	17	725
108	Hämeenkyrö	1,217	489	671	2,393	1,071	1,181	760	87	567	144	24	95	4,514
143	Ikaalinen	2,855	1,058	1,656	3,069	1,420	1,467	1,004	110	738	135	15	92	7,062
177	Juupajoki	870	366	466	1,556	753	721	411	55	301	61	8	41	2,898
211	Kangasala	1,417	600	756	2,583	1,167	1,257	825	113	597	178	20	125	5,003
250	Kilniö	1,749	498	1,155	630	244	339	495	36	374	59	6	43	2,932
289	Kuhmalahi	503	214	270	1,087	503	522	326	49	235	72	8	51	1,989
303	Kuru	3,524	1,255	2,104	3,191	1,433	1,567	1,040	107	768	115	13	77	7,870
310	Kyllmäkoski	523	211	290	905	430	424	242	34	175	36	4	24	1,706
418	Lempäälä	650	285	337	1,674	764	814	450	56	333	94	14	64	2,868
493	Mouhijärvi	746	283	424	1,236	541	617	345	41	252	61	10	40	2,388

(continued)





97	Hirvensalmi	2,552	1,216	1,249	1,646	688	865	1,107	251	728	362	39	226	5,668
171	Joroinen	2,169	905	1,160	2,948	1,568	1,239	859	172	559	261	17	162	6,236
178	Juva	5,663	2,519	2,908	5,571	2,797	2,502	1,988	410	1,305	523	35	312	13,745
213	Kangasniemi	5,170	2,421	2,545	4,833	2,431	2,163	1,833	401	1,189	485	36	297	12,321
246	Kerimäki	3,052	1,285	1,641	2,163	848	1,184	1,053	181	716	282	12	171	6,550
491	Mikkeli	8,184	3,972	3,929	7,084	3,361	3,372	3,290	749	2,158	946	80	570	19,504
507	Mäntyharju	5,956	2,664	3,048	2,846	1,139	1,521	1,696	324	1,145	374	26	207	10,872
588	Pertunmaa	1,413	685	682	1,662	781	798	930	204	628	226	21	137	4,230
593	Peksämäki	7,025	2,705	3,973	7,038	3,601	3,047	2,546	435	1,717	585	37	349	17,195
618	Punkaharju	3,224	1,563	1,536	1,889	827	966	873	165	576	224	6	127	6,210
623	Puumala	6,152	2,742	3,131	1,536	580	865	1,572	310	1,081	238	4	123	9,498
681	Rantasalmi	2,326	1,000	1,233	2,467	1,151	1,184	874	162	586	345	22	184	6,012
696	Ristina	3,358	1,599	1,637	1,931	804	1,019	1,144	243	767	281	21	162	6,714
740	Savonlinna	4,804	2,081	2,533	2,717	1,063	1,503	1,541	263	1,059	438	9	257	9,501
741	Savonranta	1,717	747	905	1,921	815	978	673	154	434	216	14	123	4,527
768	Sulkava	3,448	1,490	1,812	2,056	913	1,037	967	183	651	253	7	135	6,724
Total														
	Multi-source inventory	72,167	31,715	37,500	57,486	26,734	27,618	24,981	4,983	16,653	6,703	446	3,907	161,336
	Field inventory	72,397			58,939			26,304			7,629			165,270
	SE of field inventory	1,766			1,733			823			473			2,567

**Etelä-Pohjanmaa***Municipality*

4	Alahärmä	949	221	656	358	106	225	254	14	190	34	2	27	1,594
5	Alajärvi	3,223	986	2,010	715	294	375	715	30	529	69	5	47	4,722
10	Alavus	3,573	1,173	2,166	907	381	471	696	34	515	63	6	43	5,238
52	Evijärvi	1,351	344	909	565	217	320	351	19	265	38	2	28	2,305
74	Halsua	1,405	269	1,001	151	48	84	404	12	296	60	1	40	2,020
95	Himanka	929	197	659	389	131	231	341	9	266	33	1	24	1,692
145	Ilmajoki	1,661	533	1,020	1,514	672	765	453	35	318	88	24	53	3,715
151	Isojoki	2,337	674	1,498	1,679	681	909	735	39	570	110	14	83	4,862
152	Isokyrö	717	167	481	709	270	390	320	24	228	59	6	41	1,805
164	Jalasjärvi	3,047	873	1,974	1,189	512	608	685	28	503	83	6	59	5,003

(continued)

Table 7b (continued)

	Pine				Spruce				Birch				Other deciduous tree species				All tree species
	Total		Pulp-wood		Total		Pulp-wood		Total		Pulp-wood		Total		Pulp-wood		
	Logs	Wood	Logs	Wood	Logs	Wood	Logs	Wood	Logs	Wood	Logs	Wood	Logs	Wood	Logs	Wood	
	(1,000m <sup>3</sup> )																
175	1,381	466	832	1,396	552	769	498	30	379	73	9	52	3,348				
217	1,482	326	1,038	466	159	271	635	15	494	47	1	34	2,630				
218	590	188	367	472	169	277	170	9	127	22	3	15	1,253				
232	4,226	1,024	2,878	1,570	601	875	856	35	658	95	8	74	6,747				
233	1,646	462	1,070	600	233	332	400	23	299	40	3	29	2,686				
236	1,230	283	839	283	104	160	380	10	286	26	0	19	1,918				
281	1,193	290	811	447	161	257	298	14	225	30	2	23	1,968				
300	2,137	789	1,222	739	320	382	375	23	272	28	2	19	3,280				
301	1,435	505	852	910	385	475	329	14	242	47	6	32	2,720				
315	2,336	521	1,622	806	287	467	834	23	636	67	2	51	4,044				
399	1,309	384	833	1,413	569	757	628	40	455	109	11	81	3,459				
403	1,680	441	1,125	564	217	312	489	22	374	44	4	32	2,777				
408	2,418	747	1,509	1,144	475	609	656	40	478	93	5	64	4,311				
414	1,178	418	695	288	120	152	226	9	165	21	1	14	1,712				
421	1,807	438	1,212	417	169	217	495	19	362	76	0	49	2,795				
429	1,473	322	1,031	511	171	304	491	14	376	42	1	33	2,517				
544	1,225	380	764	541	226	285	312	12	225	37	2	27	2,116				
584	2,686	485	1,929	279	95	156	478	14	329	107	3	71	3,551				
743	1,947	525	1,272	604	250	314	538	25	396	63	8	43	3,153				
759	2,643	816	1,649	768	327	393	531	23	390	58	3	38	4,002				
846	1,641	553	995	1,432	559	797	490	23	371	60	7	42	3,622				
849	1,993	522	1,325	569	236	297	734	26	553	103	0	74	3,399				
863	1,525	570	864	509	235	248	212	13	151	18	1	12	2,264				

885	Ullava	633	151	432	144	64	72	185	5	138	24	0	17	985
924	Veteli	1,814	441	1,224	598	241	324	579	24	443	81	8	56	3,072
934	Vimpeli	1,087	286	715	307	127	162	314	16	235	39	4	27	1,746
942	Vähäkylä	262	72	171	394	135	233	165	13	117	67	3	54	887
971	Ylihärnä	317	76	217	180	59	110	110	9	81	18	1	14	625
975	Ylistaro	1,184	362	735	1,000	389	547	440	32	311	65	8	43	2,689
989	Ähtäri	3,876	1,246	2,379	1,682	780	807	802	62	571	97	7	59	6,457
Total														
	Multi-source inventory	69,546	19,528	44,979	29,209	11,727	15,740	18,605	881	13,820	2,332	183	1,645	119,692
	Field inventory	69,119			29,533			19,862			3,127			121,642
	SE of field inventory	1,780			1,328			704			302			2,713
<b>Keski-Suomi</b>														
<i>Municipality</i>														
77	Hankasalmi	1,950	823	1,036	3,313	1,675	1,503	855	169	573	276	11	172	6,393
172	Joutsa	1,546	627	845	2,904	1,376	1,396	913	175	609	378	18	242	5,742
179	Jyväskylä	288	112	161	464	226	218	130	24	87	53	2	34	936
180	Jyväskylän mlk	1,579	627	873	2,362	1,153	1,109	621	120	409	206	11	131	4,768
182	Jämsä	4,364	1,792	2,369	6,852	3,333	3,187	1,757	286	1,216	448	32	292	13,422
183	Jämsänkoski	1,604	607	912	1,909	906	910	524	85	347	161	8	100	4,198
216	Kannonkoski	2,140	667	1,343	1,510	661	763	540	60	376	108	5	64	4,299
226	Karstula	3,901	1,044	2,584	1,920	838	968	911	76	640	152	7	87	6,885
249	Keuruu	5,658	2,013	3,334	4,577	2,185	2,150	1,389	144	962	221	5	126	11,845
256	Kinnula	1,880	480	1,262	786	311	415	480	31	344	79	3	43	3,225
265	Kivijärvi	2,293	668	1,476	1,196	516	605	498	44	351	90	4	50	4,076
275	Konnevesi	1,908	770	1,041	2,760	1,338	1,303	732	136	493	217	8	133	5,617
277	Korpilahti	2,199	874	1,214	3,488	1,687	1,651	906	169	599	332	16	211	6,925
291	Kuhmoinen	2,568	1,072	1,372	4,013	2,006	1,828	883	170	575	342	20	223	7,806
312	Kyjjärvi	1,731	429	1,168	530	205	288	347	20	248	50	2	27	2,657
410	Laukaa	2,255	910	1,232	3,165	1,538	1,492	828	160	550	269	13	169	6,517
415	Leivonmäki	1,544	569	897	1,936	893	954	549	105	360	150	8	98	4,179
435	Luhanka	723	284	402	1,157	545	558	370	68	247	149	7	95	2,399
495	Multia	3,418	1,014	2,195	2,225	1,023	1,086	841	89	577	134	6	81	6,618
500	Muurame	467	184	258	770	373	364	199	36	132	78	4	48	1,514

(continued)

Table 7b (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Pulp-wood		Total	Pulp-wood		Total	Pulp-wood		Total	Pulp-wood		Total	
	Logs	wood		Logs	wood		Logs	wood		Logs	wood		
	(1,000m <sup>3</sup> )												
592	1,879	661	1,114	2,048	971	981	588	97	387	167	9	105	4,682
601	4,501	1,238	2,951	2,864	1,211	1,463	1,258	106	894	259	10	150	8,882
633	1,604	468	1,035	927	417	458	398	38	276	65	3	38	2,993
729	3,819	1,315	2,288	3,470	1,621	1,684	1,124	160	764	248	12	148	8,661
850	1,383	554	761	1,895	893	917	562	109	373	179	9	115	4,019
892	1,524	537	900	1,513	724	720	424	73	278	111	6	70	3,573
931	4,921	1,680	2,949	5,056	2,286	2,503	1,656	218	1,157	448	25	274	12,081
992	3,783	1,395	2,175	3,804	1,705	1,914	1,148	194	778	302	13	185	9,036
Total	67,430	23,414	40,147	69,413	32,617	33,387	21,432	3,161	14,602	5,671	278	3,510	163,946
Multi-source inventory	67,987			67,746			22,323			5,827			163,883
Field inventory	1,589			2,139			734			357			2,932
<b>Pohjois-Savo</b>													
<i>Municipality</i>													
140	1,794	538	1,143	3,170	1,505	1,502	999	91	720	305	11	178	6,268
174	1,332	516	749	2,308	1,209	997	622	86	437	258	9	159	4,520
204	2,680	1,102	1,446	3,452	1,818	1,477	926	141	647	330	8	204	7,388
227	1,509	603	825	2,492	1,256	1,120	792	129	551	290	10	184	5,082
239	1,796	590	1,097	1,861	867	893	687	77	492	164	7	102	4,509
263	3,660	920	2,481	3,619	1,492	1,876	1,867	113	1,364	404	16	249	9,550
297	3,365	1,495	1,713	6,562	3,482	2,797	1,759	316	1,214	748	25	479	12,435
402	1,590	493	1,005	2,808	1,388	1,281	858	86	619	259	9	156	5,516
420	3,761	1,739	1,849	7,445	4,024	3,103	1,940	387	1,327	760	25	491	13,905
476	1,172	422	688	2,535	1,288	1,134	627	85	446	235	10	145	4,568
534	1,877	652	1,124	3,655	1,896	1,595	1,017	117	726	390	14	236	6,939

595	Pielavesi	3,691	1,154	2,307	4,909	2,283	2,359	1,666	172	1,194	479	22	293	10,745
686	Rautalampi	1,919	784	1,035	2,541	1,215	1,206	831	148	569	282	11	178	5,574
687	Rautavaara	4,055	1,061	2,735	3,311	1,398	1,697	1,635	110	1,180	338	10	209	9,338
749	Siilinjärvi	859	337	479	1,865	965	818	483	69	340	212	7	133	3,419
762	Sonkajärvi	4,699	1,166	3,203	4,167	1,729	2,158	2,088	123	1,521	385	12	230	11,339
778	Suonenjoki	2,624	1,137	1,358	4,009	2,054	1,784	1,077	199	740	344	15	216	8,054
844	Tervo	1,118	429	629	1,725	837	804	516	83	359	191	7	118	3,550
857	Tuusniemi	1,611	709	817	2,855	1,512	1,209	817	148	559	343	11	213	5,627
915	Varkaus	1,580	673	844	2,033	1,026	911	575	129	370	201	13	109	4,389
916	Varpaisjärvi	1,342	421	843	2,170	1,061	1,000	703	67	506	210	7	125	4,425
921	Vesanto	1,471	544	846	1,920	900	926	603	97	414	173	8	108	4,167
925	Vieremä	2,804	727	1,884	2,534	1,031	1,323	1,339	81	971	241	7	144	6,919
Total														
	Multi-source inventory	52,309	18,215	31,099	73,947	36,238	33,971	24,428	3,056	17,268	7,543	275	4,660	158,226
	Field inventory	49,831			71,029			25,339			9,064			155,263
	SE of field inventory	1,443			2,097			795			523			2,729
<b>Pohjois-Karjala</b>														
<i>Municipality</i>														
45	Eno	3,901	1,352	2,329	2,884	1,298	1,409	1,399	216	986	237	4	112	8,419
146	Ilomantsi	13,541	3,651	8,956	4,369	1,704	2,362	2,460	194	1,625	391	8	190	20,761
167	Joensuu	4,949	1,624	3,099	4,543	2,001	2,323	1,738	255	1,191	323	10	150	11,553
176	Juuka	6,862	1,895	4,578	4,233	1,885	2,086	1,802	171	1,252	485	16	259	13,381
248	Kesälahti	2,289	892	1,278	824	301	469	578	79	398	171	3	93	3,862
260	Kitee	4,009	1,475	2,326	2,888	1,247	1,464	1,351	200	908	310	5	120	8,558
276	Kontiolahti	4,325	1,822	2,303	2,004	887	1,003	1,251	113	918	266	10	138	7,847
309	Outokumpu	2,177	861	1,221	1,402	529	783	756	80	573	299	3	165	4,635
422	Lieksa	17,766	5,230	11,466	6,192	2,569	3,177	3,812	339	2,562	657	24	351	28,427
426	Liperi	3,146	1,120	1,886	2,312	963	1,205	1,064	169	734	326	22	196	6,848
541	Nurmes	5,893	1,578	3,926	4,268	1,745	2,254	2,091	190	1,422	470	11	255	12,722
607	Polvijärvi	3,620	1,041	2,418	2,055	830	1,092	1,204	127	879	430	5	256	7,309
632	Pyhäselkä	786	301	452	1,153	504	593	482	70	337	127	1	84	2,548
707	Rääkkylä	1,878	708	1,105	1,479	695	715	890	113	629	198	7	111	4,445

(continued)

Table 7b (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Total	Logs	Pulp-wood	Total	Logs	Pulp-wood	Total	Logs	Pulp-wood	Total	Logs	Pulp-wood	
848	3,832	1,282	2,384	2,767	1,292	1,332	928	144	591	236	5	117	7,762
911	2,645	640	1,827	1,865	713	1,031	1,000	93	683	249	2	126	5,759
Total	81,617	25,473	51,553	45,236	19,162	23,296	22,806	2,553	15,689	5,177	136	2,725	154,836
Field inventory	78,937		46,997				24,006			5,948			155,889
SE of field inventory	1,862		1,712				723			406			2,529
<b>Kainuu</b>													
<i>Municipality</i>													
105	5,330	1,439	3,540	2,474	846	1,441	1,422	33	981	142	7	78	9,369
205	7,915	1,716	5,614	1,447	414	870	2,319	34	1,650	266	10	172	11,947
290	22,216	6,909	13,860	7,155	2,191	4,366	4,234	104	2,753	471	11	248	34,076
578	3,691	914	2,561	1,745	598	1,018	1,248	36	899	152	4	87	6,836
620	8,119	2,082	5,456	4,188	1,412	2,484	2,196	63	1,561	224	7	124	14,726
697	2,955	796	1,978	1,826	616	1,071	1,053	33	757	117	3	61	5,950
765	10,622	2,492	7,458	5,086	1,682	2,965	3,320	89	2,304	446	21	260	19,474
777	19,254	5,702	12,199	7,243	2,159	4,502	3,749	70	2,571	372	14	232	30,617
785	5,084	1,208	3,482	357	115	203	1,168	20	823	120	9	87	6,729
Total	85,187	23,257	56,149	31,520	10,032	18,921	20,709	482	14,300	2,310	86	1,348	139,726
Field inventory	82,632		32,626				21,566			2,500			139,324
SE of field inventory	1,724		1,471				618			246			2,499

<b>Pohjois-Pohjanmaa</b>																(continued)
<i>Municipality</i>																
9	Alavieska	843	171	613	284	91	169	244	6	180	42	2	26	1,413		
69	Haapajärvi	3,031	721	2,098	1,288	429	757	1,119	43	834	234	8	158	5,672		
71	Haapavesi	3,610	867	2,506	1,310	347	838	1,977	37	1,523	353	11	263	7,250		
72	Hailuoto	724	173	484	85	26	53	218	1	149	40	2	30	1,066		
84	Haukipudas	1,411	303	995	506	140	324	504	8	377	70	4	45	2,492		
139	Ii	4,462	918	3,172	1,564	360	1,051	2,261	24	1,700	308	19	211	8,595		
208	Kalajoki	2,319	402	1,731	553	120	370	748	15	556	75	4	41	3,695		
244	Kempele	330	67	233	66	17	44	133	1	94	21	1	16	550		
247	Kestilä	2,326	434	1,696	199	47	128	751	9	532	79	5	58	3,355		
255	Kiminki	1,240	248	895	409	105	267	330	4	240	37	2	22	2,015		
305	Kuusamo	14,585	3,929	9,676	6,593	1,912	4,197	2,750	32	1,988	455	6	257	24,384		
317	Kärsämäki	2,663	563	1,919	763	206	485	1,226	26	897	273	11	209	4,925		
425	Liminka	1,668	242	1,251	138	38	87	735	6	507	87	6	68	2,628		
436	Lumijoki	581	110	420	103	27	68	317	2	219	50	2	39	1,050		
483	Merijärvi	885	175	654	407	123	251	349	5	274	64	2	45	1,704		
494	Muhos	2,496	525	1,743	293	77	188	650	5	461	76	5	56	3,514		
535	Nivala	1,474	381	1,001	810	286	471	564	16	438	115	4	80	2,963		
563	Oulainen	1,923	439	1,361	1,009	335	601	919	13	733	184	6	140	4,035		
564	Oulu	1,073	240	754	347	91	227	346	4	259	55	4	37	1,820		
567	Oulunsalo	543	110	384	140	32	95	182	2	133	27	1	19	892		
603	Piippola	1,897	353	1,395	284	67	186	749	9	547	103	6	75	3,033		
615	Pudasjärvi	16,567	2,815	12,316	4,554	1,159	2,997	3,453	40	2,452	394	6	232	24,968		
617	Pulkkila	1,625	302	1,199	305	81	195	646	8	473	95	6	71	2,671		
625	Pyhäjäoki	1,833	337	1,358	631	154	412	898	15	694	149	10	94	3,511		
626	Pyhäsalmi	5,066	1,035	3,693	1,936	597	1,175	2,042	54	1,513	298	10	190	9,342		
630	Pyhäntä	3,527	707	2,551	379	93	246	979	13	690	116	5	82	5,001		
678	Raate	1,817	393	1,278	639	189	399	832	10	635	176	14	118	3,464		
682	Rantsila	2,642	438	1,957	325	81	210	963	9	691	113	7	83	4,042		
691	Reisjärvi	2,000	397	1,436	430	159	235	480	21	336	95	3	48	3,005		

Table 7b (continued)

	Pine			Spruce			Birch			Other deciduous tree species			All tree species
	Total	Pulp-wood		Total	Pulp-wood		Total	Pulp-wood		Total	Pulp-wood		
		Logs	wood		Logs	wood		Logs	wood		Logs	wood	
	(1,000m <sup>3</sup> )												
746	2,967	641	2,097	554	195	312	753	26	543	109	6	59	4,383
748	3,383	631	2,444	595	151	393	1,345	9	962	197	8	153	5,521
832	7,410	1,716	5,212	3,751	1,102	2,402	1,676	29	1,162	260	3	160	13,097
859	1,290	194	961	86	22	55	434	4	301	40	3	30	1,851
889	6,123	1,205	4,361	604	142	390	1,253	19	920	129	7	96	8,109
926	1,686	330	1,215	431	122	272	656	7	492	107	7	74	2,879
972	2,358	426	1,714	515	95	359	720	6	519	70	3	46	3,664
973	3,732	695	2,696	770	176	519	950	7	698	95	6	73	5,547
977	1,867	401	1,329	790	275	459	721	14	556	136	6	96	3,515
Total	115,979	24,036	82,797	34,447	9,669	21,887	35,871	560	26,281	5,327	225	3,601	191,624
Multi-source inventory	113,490			38,386			37,256			5,726			194,859
Field inventory	2,371			1,713			1,006			383			3,335
<b>Lapland</b>													
<i>Municipality</i>													
47	4,009	799	3,024	322	80	217	827	0	399	17	0	1	5,175
148	39,403	6,757	30,503	2,514	685	1,700	3,974	0	2,194	58	0	27	45,949
240	101	11	80	187	64	109	147	1	108	15	0	10	450
241	862	133	642	1,236	330	791	1,130	14	832	83	1	57	3,313
261	14,309	2,915	10,431	5,542	1,155	3,880	5,267	35	3,756	244	15	129	25,363
273	6,919	1,586	4,798	1,833	230	1,347	1,776	16	1,245	121	1	68	10,649
320	11,080	2,116	8,072	1,997	320	1,444	1,926	11	1,284	111	4	43	15,114
498	5,856	1,643	3,938	1,172	281	792	831	5	544	45	0	24	7,904
583	4,360	735	3,257	1,294	199	927	1,424	5	918	107	5	60	7,186



614	Posio	9,127	1,940	6,549	2,752	670	1,881	1,312	11	938	140	1	65	13,331
683	Ranua	7,415	1,098	5,588	1,783	223	1,315	1,605	6	1,045	114	2	59	10,916
698	Rovaniemi	21,864	4,039	15,906	6,119	748	4,562	4,611	48	3,255	363	8	197	32,957
732	Salla	13,670	2,624	10,085	6,217	1,518	4,162	3,530	30	2,466	349	18	204	23,766
742	Savukoski	17,735	3,490	13,095	4,965	1,305	3,246	2,842	21	2,003	139	2	54	25,681
751	Simo	3,007	627	2,042	1,312	246	915	2,006	21	1,468	116	2	79	6,442
758	Sodankylä	23,516	4,928	17,186	6,835	1,636	4,719	5,666	11	3,858	156	11	66	36,172
845	Tervola	2,871	396	2,182	2,581	434	1,829	1,901	18	1,345	156	6	103	7,508
851	Tomio	1,443	181	1,113	2,341	551	1,576	1,981	30	1,424	169	4	111	5,934
854	Pello	4,825	990	3,374	1,631	200	1,201	1,487	11	1,034	134	1	76	8,077
890	Utsjoki	256	7	211	24	5	18	59	0	18	0	0	0	339
976	Ylitornio	4,780	874	3,352	1,779	214	1,311	2,116	19	1,477	124	2	78	8,800
Total														
	Multi-source inventory	197,409	37,891	145,426	54,437	11,091	37,942	46,419	312	31,611	2,762	84	1,512	301,026
	Field inventory	195,529			58,948			48,261			3,117			305,854
	SE of field inventory	4,726			2,452			1,532			278			5,598

**Table 8a** The biomass by forestry centres and by tree species of the tree compartments available for energy wood in young thinning stands (forest land) where cutting proposed for first 5-year-period, estimated removal 28–43%.

Åland Municipality	Pine			Spruce			Deciduous tree species			All tree species		
	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage
35 Brändö	0	0	0	-	-	-	3	1	0	3	1	0
43 Eckerö	3	1	0	0	0	0	8	2	1	13	4	2
60 Finström	4	1	1	0	0	0	11	3	1	16	5	2
62 Föglö	4	1	0	0	0	0	6	2	1	11	3	1
65 Geta	2	1	0	0	0	0	4	1	0	7	2	1
76 Hammarland	5	2	1	1	1	0	12	3	1	18	6	2
170 Jomala	5	2	1	1	1	0	12	3	1	19	6	2
295 Kumlinge	2	1	0	0	0	0	3	1	0	5	2	1
318 Kökar	0	0	0	-	-	-	1	0	0	1	0	0
417 Lemland	4	1	1	1	1	0	11	3	1	17	5	2
438 Lumparland	1	0	0	0	0	0	2	0	0	3	1	0
478 Mariehamn	0	0	0	0	0	0	1	0	0	1	0	0
736 Saltvik	4	2	1	1	1	0	6	2	1	11	4	1
766 Sottunga	0	0	0	0	0	0	1	0	0	1	0	0
771 Sund	4	1	0	1	0	0	7	2	1	11	4	1
941 Vårdö	2	1	0	0	0	0	3	1	0	6	2	1
Total	43	15	5	9	4	3	90	25	9	142	45	17

## Rannikko/Etelärannikko

Municipality	14	3	1	1	1	1	0	3	1	0	18	5	2
40 Dragsfjärd	7	2	1	5	2	1	24	6	6	2	36	10	4
49 Espoo-Esbo	9	2	1	3	1	1	12	3	3	1	24	7	3
78 Hanko-Hangö	3	1	0	2	1	1	12	4	4	1	17	5	2
91 Helsinki-Helsingfors	7	2	1	5	2	1	23	6	6	2	35	10	4
101 Vantaa-Vanda	10	3	1	1	0	0	0	0	0	0	11	3	1
Houtskär-Houtskari	8	2	1	4	2	1	13	3	3	1	25	7	3
149 Ingå-Inkoo	3	1	0	1	0	0	0	0	0	0	4	1	1
150 Iniö	6	2	1	5	2	1	6	2	2	1	17	5	3
220 Karis-Karjaa	0	0	0	0	0	0	0	0	0	0	1	0	0
235 Kauniainen-Grankulla	10	2	1	4	2	1	6	2	2	1	20	6	3
243 Kimito-Kemiö	6	2	1	5	2	1	23	6	6	2	35	10	4
257 Kirkkonummi-Kyrkslätt	7	2	1	1	0	0	1	0	0	0	9	3	1
279 Korpo-Korppoo	10	3	1	20	7	4	22	6	6	2	53	16	8
407 Lapinjärvi-Lappträsk	4	1	0	6	2	1	7	2	2	1	16	5	2
424 Liljendal	3	1	0	5	2	1	3	1	1	0	10	3	2
434 Loviisa-Lovisa													

(continued)

Table 8a (continued)

	Pine			Spruce			Deciduous tree species			All tree species			
	Stem and bark	Stem and bark		Stem and bark	Stem and bark		Stem and bark	Stem and bark		Stem and bark	Stem and bark		
		Branches	Foliage		Branches	Foliage		Branches	Foliage		Branches	Foliage	
	(1,000t)												
533	6	2	1	4	2	1	5	2	2	1	15	5	2
573	8	2	1	3	2	1	7	2	2	1	18	5	2
585	24	5	2	37	13	8	35	9	9	3	96	27	13
	Pernaja												
606	14	4	1	6	2	2	7	2	2	1	27	8	4
638	38	8	3	51	19	11	52	13	13	4	141	40	18
	Borgå												
701	15	4	2	23	8	5	27	7	7	2	65	19	9
	Strömfors												
753	21	5	2	17	6	4	24	6	6	2	61	17	8
755	6	2	1	5	2	1	13	3	3	1	24	7	3
835	42	11	4	17	7	4	28	8	8	3	87	25	11
	Tammisaari												
923	4	1	0	1	1	0	2	1	1	0	8	2	1
Total	287	71	27	233	87	55	356	93	93	33	876	250	115
<b>Rannikko/Pohjanmaa</b>													
<i>Municipality</i>													
231	0	0	0	0	0	0	0	0	0	0	1	0	0
272	15	4	2	4	1	1	16	5	5	2	36	10	4
280	10	3	1	2	1	1	11	3	3	1	23	7	3

287	Kristinestad- Kristiinani- kaupunki	22	7	3	17	8	5	22	6	2	60	20	10
288	Kronoby- Kruunupyö	40	10	4	9	3	2	33	9	4	82	23	10
440	Larsmo-Luoto	5	1	1	3	1	1	4	1	0	13	4	2
475	Malax-Maalaihti	18	5	2	5	3	2	22	6	3	45	14	6
499	Korsholm- Mustasaari	18	5	2	19	9	5	34	10	4	71	25	12
545	Närpes-Närpiö	19	6	2	23	11	7	28	8	3	70	24	12
559	Oravais- Oravainen	6	1	1	4	2	1	11	3	2	22	7	3
598	Jakobstad- Pietarsaari	3	1	0	2	1	0	4	1	1	10	3	1
599	Pedersöre- Pedersören kunta	46	11	5	14	6	4	39	11	5	100	28	13
893	Nykarleby- Uusikaarlepyy	37	9	4	13	6	3	43	12	5	94	27	12
905	Vaasa-Vasa	3	1	0	2	1	1	5	2	1	11	4	2
945	Vörå-Maxmo- Vöyri- Maksamaa	18	5	2	15	6	3	30	8	4	64	19	9
Total		262	69	27	133	58	36	305	86	35	699	213	99

(continued)

Table 8a (continued)

	Pine			Spruce			Deciduous tree species			All tree species		
	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage
<b>Lounais-Suomi</b>												
<i>Municipality</i>												
6	11	3	1	7	3	2	12	3	1	30	9	4
17	2	1	0	2	1	0	1	0	0	5	2	1
19	4	1	0	2	1	0	3	1	0	8	2	1
50	33	8	3	21	8	6	26	7	3	81	23	11
51	27	7	3	20	8	5	22	6	2	68	20	10
73	19	5	2	7	3	2	8	2	1	34	10	4
79	8	2	1	6	2	2	7	2	1	21	6	3
99	24	6	2	3	1	1	15	5	2	42	12	5
102	20	4	2	18	7	5	25	6	2	63	18	9
181	17	4	2	8	3	2	13	3	1	38	11	5
202	2	1	0	1	0	0	1	0	0	4	1	0
214	54	14	5	21	8	5	39	11	4	114	33	15
230	30	7	3	3	1	1	18	6	2	51	14	6
252	11	3	1	5	2	1	10	3	1	26	7	4
254	16	4	1	8	3	2	8	2	1	32	9	4
259	13	3	1	7	3	2	11	3	1	31	9	4
262	8	2	1	8	3	2	8	2	1	23	7	3
271	35	9	3	25	10	7	26	7	2	86	25	13
284	6	1	1	5	2	1	8	2	1	20	5	3
304	3	1	0	5	2	1	3	1	0	11	3	2
308	5	1	0	2	1	1	4	1	0	11	3	1
319	14	3	1	8	3	2	11	3	1	33	9	5

400	Laitila	43	10	4	23	9	6	26	7	3	92	26	13
406	Lappi	16	4	2	9	3	2	10	2	1	35	10	5
413	Lavia	33	8	3	20	8	5	22	6	2	75	21	10
419	Lemu	2	0	0	1	0	0	1	0	0	3	1	0
423	Lieto	8	2	1	4	1	1	5	1	1	16	5	2
430	Loimaa	14	3	1	13	5	4	17	4	2	43	12	6
442	Luvia	13	3	1	13	5	3	10	3	1	36	10	6
480	Marttila	10	3	1	4	2	1	8	2	1	23	6	3
481	Masku	3	1	0	2	1	1	2	1	0	8	2	1
482	Mellilä	4	1	0	2	1	1	3	1	0	9	3	1
484	Merikarvia	52	13	5	28	11	8	34	9	4	114	33	16
485	Merimasku	1	0	0	2	1	0	1	0	0	4	1	1
501	Muurila	3	1	0	2	1	0	3	1	0	8	2	1
503	Mynämäki	31	7	3	18	7	5	24	6	2	74	21	10
529	Naantali	2	1	0	1	0	0	1	0	0	4	1	1
531	Nakkila	8	2	1	10	4	3	13	3	1	31	9	5
537	Noormarkku	20	5	2	17	6	4	21	6	2	59	17	8
538	Nousiainen	10	2	1	6	2	1	7	2	1	23	6	3
561	Oripää	5	1	1	2	1	1	4	1	0	12	3	2
577	Paimio	13	3	1	4	1	1	5	1	1	21	6	3
586	Perniö	19	5	2	8	3	2	13	3	1	40	11	5
587	Pertteli	5	1	1	3	1	1	5	1	0	13	4	2
602	Piikkiö	4	1	0	1	1	0	2	0	0	7	2	1
608	Pomarkku	17	4	2	15	6	4	16	4	2	48	14	7
609	Pori	30	7	3	22	9	6	28	7	3	80	23	12
631	Pyhäranta	11	3	1	6	3	2	5	1	0	23	7	3
636	Pöytyä	20	5	2	10	4	3	17	4	2	47	13	6
680	Raisio	1	0	0	1	0	0	1	0	0	3	1	0
684	Rauma	22	5	2	13	5	3	12	3	1	47	14	7

(continued)

Table 8a (continued)

	Pine			Spruce			Deciduous tree species			All tree species		
	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage
704	2	0	0	1	0	0	1	0	0	4	1	1
705	4	1	0	3	1	1	2	0	0	8	3	1
734	7	2	1	3	1	1	5	1	1	15	4	2
738	12	3	1	6	2	1	6	1	1	23	7	3
747	43	11	4	21	8	6	34	9	4	98	29	14
761	31	7	3	23	9	6	33	8	3	88	25	12
776	8	2	1	5	2	1	6	2	1	18	5	3
783	8	2	1	5	2	1	6	2	1	19	5	3
784	4	1	0	3	1	1	3	1	0	10	3	1
833	3	1	0	3	1	1	2	0	0	8	2	1
838	4	1	0	2	1	1	4	1	0	10	3	1
853	7	2	1	3	1	1	4	1	1	15	4	2
886	29	7	3	24	10	7	29	7	3	82	24	12
895	30	7	3	14	6	4	16	4	2	61	17	8
906	4	1	0	2	1	1	3	1	0	9	3	1
913	6	1	1	5	2	1	7	2	1	18	5	3
918	9	2	1	4	2	1	6	2	1	19	5	2
920	0	0	0	0	0	0	0	0	0	1	0	0
979	22	5	2	13	5	3	18	5	2	53	15	7
Total	1,018	247	99	592	230	155	777	205	79	2,387	682	332



<b>Häme-Uusimaa</b>																
<i>Municipality</i>																
15	Artjärvi	3	1	0	8	3	2	8	2	8	2	2	1	19	6	3
16	Asikkala	16	4	1	34	13	8	52	8	14	5	103	5	103	31	15
18	Askola	4	1	0	16	5	3	8	3	2	1	28	1	28	8	4
61	Forssa	6	1	1	6	2	1	7	1	2	2	18	1	18	5	3
81	Hartola	24	6	2	69	27	16	61	16	17	6	155	6	155	50	25
82	Hattula	20	4	1	24	9	6	19	6	5	2	63	2	63	18	9
83	Hauho	5	1	1	18	7	4	13	4	3	1	37	1	37	11	6
86	Hausjärvi	14	3	1	14	5	3	19	3	4	2	47	2	47	12	6
98	Hollola	9	2	1	18	7	4	22	4	6	2	48	2	48	15	7
103	Humppila	1	0	0	1	1	0	3	0	1	0	5	0	5	2	1
106	Hyvinkää	17	4	2	9	3	2	18	2	4	2	45	2	45	11	5
109	Hämeenlinna	6	1	0	11	4	2	11	2	3	1	29	1	29	8	4
111	Hemola	33	7	3	47	16	10	63	10	17	7	144	7	144	41	19
165	Janakkala	10	2	1	29	10	6	41	6	9	3	80	3	80	22	10
169	Jokioinen	4	1	0	2	1	1	4	1	1	0	11	0	11	3	1
186	Järvenpää	1	0	0	1	0	0	2	0	0	0	4	0	4	1	0
210	Kalvola	25	5	2	21	8	5	22	5	6	2	68	2	68	19	9
223	Karjalohja	8	2	1	3	1	1	3	1	1	0	14	0	14	4	2
224	Karkkila	7	2	1	9	3	2	16	2	4	1	31	1	31	9	4
245	Kerava	1	0	0	2	1	0	2	0	2	0	5	0	5	1	1
283	Hämeenkoski	4	1	0	10	4	3	9	3	2	1	23	1	23	7	4
316	Kärkölä	7	2	1	11	4	3	12	3	3	1	30	1	30	9	5

(continued)

Table 8a (continued)

	Pine			Spruce			Deciduous tree species			All tree species		
	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage	Stem and bark	Branches	Foliage
	(1,000t)											
398	3	1	0	4	2	1	7	2	1	15	4	2
401	16	4	2	33	13	8	25	7	3	74	23	12
433	17	4	2	28	10	6	46	11	4	91	25	12
444	10	3	1	4	1	1	13	4	1	27	8	4
504	5	1	1	15	5	3	9	2	1	29	9	5
	Mörskom											
505	21	4	2	35	11	7	26	6	3	82	22	11
532	9	2	1	12	5	3	18	5	2	38	12	6
540	23	6	2	16	6	4	25	6	3	64	18	9
543	16	4	2	9	3	2	26	6	3	51	14	6
560	14	4	2	18	7	4	25	6	2	57	17	8
576	23	5	2	29	10	7	41	11	4	93	26	12
611	4	1	0	11	4	2	10	2	1	24	7	3
616	3	1	0	8	3	2	6	1	1	16	5	2
692	12	2	1	14	5	3	14	4	1	40	11	5
694	4	1	0	4	1	1	8	2	1	16	4	2
737	5	1	0	2	1	0	2	1	0	8	2	1
781	19	5	2	68	27	16	73	20	7	161	52	25
834	19	5	2	24	8	5	31	8	3	74	21	10
855	3	1	0	9	4	2	8	2	1	20	6	3
858	8	2	1	9	3	2	17	4	2	34	9	4
927	24	7	3	13	5	3	44	11	5	82	23	11
981	3	1	0	2	1	0	5	1	0	10	3	1
Total	486	114	46	730	267	167	895	231	85	2,111	612	297

<b>Kaakkois-Suomi</b>																
<i>Municipality</i>																
44	Elimäki	16	4	1	17	6	4	19	5	2	52	15	7			
75	Hamina	68	16	6	30	11	7	25	7	3	123	33	16			
142	Iitti	43	10	4	30	11	7	40	10	4	113	31	15			
153	Imatra	9	2	1	17	6	4	12	3	2	38	11	6			
163	Jaala	54	11	4	26	9	6	36	9	4	117	30	14			
173	Joutseno	19	4	2	32	12	3	29	7	3	79	23	12			
285	Kotka	15	3	1	11	4	2	17	4	2	44	12	5			
286	Kouvola	3	1	0	2	1	0	2	1	0	7	2	1			
306	Kuusankoski	11	3	1	6	2	1	8	2	1	24	7	3			
405	Lappeenranta	71	16	6	42	15	9	48	12	4	162	43	20			
416	Lemi	19	4	2	15	5	3	19	5	2	53	14	7			
441	Luumäki	97	22	9	34	12	8	34	9	4	164	43	20			
489	Miehikkälä	45	11	4	18	7	5	12	3	1	76	21	10			
580	Parikkala	43	10	4	44	18	11	42	12	5	129	39	20			
624	Pyhtää-Pyttis	17	3	1	21	7	5	25	6	2	63	17	8			
689	Rautjärvi	28	6	2	33	13	8	36	10	4	97	29	15			
700	Ruokolahti	132	27	11	69	26	16	74	20	9	274	73	36			
739	Savitaipale	77	16	6	36	13	8	39	10	4	153	39	18			
754	Anjalankoski	69	16	6	34	12	8	37	10	4	141	38	18			
775	Suomenmemi	46	9	3	17	6	4	17	5	2	80	20	10			
831	Taipalsaari	39	8	3	28	10	6	36	9	4	103	28	14			
909	Valkeala	110	24	10	46	17	10	48	13	6	204	53	26			
935	Virolahti	37	9	3	14	5	3	8	2	1	58	16	8			
978	Ylämaa	42	10	4	17	7	4	12	3	1	71	20	9			
Total		1,110	245	96	640	234	147	676	178	75	2,426	656	318			

(continued)



912	Vammala	56	14	5	53	20	13	49	13	5	158	47	24
922	Vesilahti	16	4	1	20	7	5	17	4	2	54	16	8
933	Vilppula	32	7	3	34	13	9	42	11	4	108	31	15
936	Virrat	101	23	9	49	19	13	66	17	7	215	59	28
980	Ylöjärvi	22	6	2	30	11	7	36	9	3	88	25	12
988	Äetsä	21	5	2	13	5	4	12	3	1	47	14	7
Total		810	187	72	744	278	181	897	231	86	2,451	695	338
<b>Etelä-Savo</b>													
<i>Municipality</i>													
46	Enonkoski	15	4	1	18	8	5	40	11	4	74	23	11
90	Heinävesi	133	28	11	128	49	31	60	17	7	322	94	49
97	Hirvensalmi	40	9	3	34	12	7	34	10	6	108	30	17
171	Joroinen	46	10	4	25	11	7	43	12	4	114	34	16
178	Juva	107	23	9	62	25	15	88	25	18	256	73	42
213	Kangasniemi	73	17	6	53	21	13	76	21	8	201	59	28
246	Kerimäki	47	10	4	45	16	10	47	13	6	139	39	20
491	Mikkeli	117	26	10	113	43	27	124	34	13	354	104	50
507	Mäntyharju	120	25	10	58	22	14	78	21	9	256	69	33
588	Pertunmaa	17	4	1	20	8	5	22	6	2	59	18	9
593	Pieksämäki	123	29	12	62	27	17	130	36	13	316	92	42
618	Punkaharju	36	8	3	40	14	9	28	8	3	104	30	15
623	Puumala	144	29	11	44	16	10	58	15	7	247	60	28
681	Rantasalmi	41	9	3	23	9	6	49	14	6	113	32	16
696	Ristiina	56	12	5	39	14	9	41	11	5	135	37	19
740	Savonlinna	89	19	7	69	24	15	68	20	21	225	64	43
741	Savonranta	22	5	2	26	11	7	36	11	4	85	26	13
768	Sulkava	60	13	5	34	12	8	58	21	49	151	46	62
Total		1,288	281	107	893	344	214	1,080	306	187	3,261	930	509

(continued)

Table 8a (continued)

	Pine						Spruce						Deciduous tree species						All tree species						
	Stem and bark		Branches		Foliage		Stem and bark		Branches		Foliage		Stem and bark		Branches		Foliage		Stem and bark		Branches		Foliage		
	(1,000t)																								
<b>Etelä-Pohjanmaa</b>																									
<i>Municipality</i>																									
4	17	4	2	3	1	1	12	3	1	1	1	33	9	4	4	4	3	1	33	9	4	4	4	22	9
5	44	10	4	5	2	1	35	5	2	1	1	84	22	9	10	4	4	4	84	22	9	4	4	25	9
10	46	11	4	9	4	2	38	9	4	2	1	93	25	11	11	4	4	4	93	25	11	4	4	11	11
52	20	5	2	4	1	1	13	4	1	1	1	37	10	4	4	1	1	1	37	10	4	1	1	10	4
74	16	4	2	1	1	1	13	1	1	1	1	31	9	4	4	1	1	1	31	9	4	1	1	9	4
95	20	4	2	4	2	1	22	4	2	1	1	47	13	6	6	2	2	2	47	13	6	2	2	13	6
145	10	3	1	5	2	1	7	5	2	1	1	22	7	3	2	1	1	1	22	7	3	1	1	7	3
151	29	7	3	7	3	2	19	7	3	2	1	54	15	5	5	2	2	2	54	15	5	2	2	15	5
152	9	2	1	4	2	1	9	4	2	1	1	22	6	3	3	1	1	1	22	6	3	1	1	6	3
164	40	9	3	8	3	2	25	8	3	2	1	73	19	7	7	3	3	3	73	19	7	3	3	19	7
175	6	2	1	5	2	1	8	5	2	1	1	19	6	2	2	1	1	1	19	6	2	1	1	6	2
217	32	7	3	7	4	3	39	7	4	3	1	78	22	11	11	4	4	4	78	22	11	4	4	22	11
218	6	1	1	2	1	1	5	2	1	1	1	13	4	1	1	1	1	1	13	4	1	1	1	4	1
232	33	8	3	13	5	3	16	13	5	3	1	62	18	5	5	2	2	2	62	18	5	2	2	18	5
233	27	6	3	5	2	1	18	5	2	1	1	50	13	5	5	2	2	2	50	13	5	2	2	13	5
236	16	4	2	2	2	1	18	2	2	1	1	36	10	5	5	2	2	2	36	10	5	2	2	10	5
281	19	4	2	3	1	1	12	3	1	1	1	33	9	4	4	1	1	1	33	9	4	1	1	9	4
300	31	7	3	6	2	1	15	6	2	1	1	52	14	4	4	2	2	2	52	14	4	2	2	14	4
301	9	2	1	4	2	1	9	4	2	1	1	23	7	3	3	1	1	1	23	7	3	1	1	7	3
315	35	8	3	5	2	2	37	5	2	2	1	76	21	10	10	4	4	4	76	21	10	4	4	21	10
399	11	3	1	5	3	2	19	5	3	2	1	35	11	6	6	2	2	2	35	11	6	2	2	11	6
403	32	8	3	5	2	1	23	5	2	1	1	60	16	7	7	3	3	3	60	16	7	3	3	16	7

408	Lapua	38	9	4	10	4	2	32	9	4	80	21	10
414	Lehtimäki	13	3	1	3	1	1	11	3	1	26	7	3
421	Lestijärvi	21	5	2	5	3	3	19	5	2	45	14	7
429	Lohdaja	24	6	2	4	2	1	26	8	3	54	15	6
544	Nurmo	12	3	1	3	1	1	11	3	1	26	7	3
584	Perho	43	11	4	3	1	1	22	7	2	68	19	7
743	Seinäjoki	27	6	2	3	1	1	22	7	3	52	14	6
759	Soini	37	8	3	5	2	1	28	8	3	70	19	8
846	Teuva	13	3	1	6	3	2	10	3	1	29	9	4
849	Toholampi	29	7	3	3	2	1	27	8	3	60	16	7
863	Töysä	22	5	2	5	2	1	11	3	1	37	10	4
885	Ullava	10	2	1	1	0	0	8	2	1	19	5	2
924	Veteli	32	7	3	5	3	2	22	7	3	60	17	8
934	Vimpeli	20	4	2	2	1	1	13	4	2	35	9	4
942	Vähäkylä	2	1	0	2	1	1	9	3	1	14	4	2
971	Ylihärmiä	6	1	1	2	1	0	6	2	1	15	4	2
975	Ylistaro	16	4	2	8	3	2	16	5	2	40	11	6
989	Ähtäri	50	12	5	14	5	4	36	10	4	100	28	12
Total		924	215	88	199	84	55	743	216	85	1,865	515	228
<b>Keski-Suomi</b>													
<i>Municipality</i>													
77	Hankasalmi	27	6	3	24	10	6	34	9	3	86	25	12
172	Joutsa	26	6	2	35	14	8	45	12	4	106	31	15
179	Jyväskylä	5	1	0	4	2	1	7	2	1	17	5	2
180	Jyväskylän mlk	25	6	2	20	8	5	28	7	3	73	21	10
182	Jämsä	70	16	6	64	25	16	77	20	8	211	60	30
183	Jämsänkoski	23	5	2	14	6	4	18	5	2	56	16	8
216	Kannonkoski	40	9	4	16	7	5	17	5	2	74	21	11
226	Karstula	60	14	5	16	7	5	23	7	3	99	28	14
249	Keuruu	60	14	5	21	9	5	33	9	4	114	31	15
256	Kinnula	30	7	3	10	5	3	14	4	2	55	16	8

(continued)

Table 8a (continued)

	Pine			Spruce			Deciduous tree species			All tree species		
	Stem and bark		Foliage	Stem and bark		Foliage	Stem and bark		Foliage	Stem and bark		Foliage
	Branches	Branches	Branches	Branches	Branches	Branches	Branches	Branches	Branches	Branches	Branches	Branches
265	39	9	3	12	5	3	13	4	2	64	18	9
275	31	7	3	22	9	6	30	8	3	84	24	12
277	34	7	3	31	12	8	37	10	4	103	29	14
291	33	7	3	27	10	7	34	9	4	94	27	13
312	22	5	2	5	2	1	8	2	1	34	10	4
410	36	8	3	28	11	7	35	9	3	99	28	14
415	18	4	2	16	6	4	19	5	2	54	15	7
435	11	3	1	13	5	3	18	5	2	42	12	6
495	48	11	4	14	6	4	18	5	2	80	22	11
500	8	2	1	7	3	2	9	2	1	24	7	3
592	28	6	2	17	7	5	20	5	2	65	18	9
601	83	19	8	33	15	10	40	12	5	157	46	23
633	23	5	2	7	3	2	9	3	1	39	11	5
729	65	15	6	30	13	9	36	10	4	131	38	19
850	20	4	2	18	7	4	25	7	3	64	18	9
892	22	5	2	12	5	3	15	4	1	49	14	7
931	96	22	9	52	24	16	58	17	7	205	62	32
992	69	16	6	37	16	11	44	12	4	150	43	21
Total	1,054	238	95	606	251	165	767	209	82	2,427	697	342
<b>Pohjois-Savo</b>												
<i>Municipality</i>												
140	31	7	3	20	9	6	44	13	6	96	30	15
174	20	5	2	19	9	5	26	8	3	66	21	10
204	27	7	3	24	11	7	29	9	3	81	27	13



227	Karttula	24	6	2	21	9	6	39	11	4	84	26	12
239	Keitele	29	7	3	17	8	5	23	7	3	70	22	11
263	Kiuruvesi	54	12	5	30	15	10	77	23	10	161	50	25
297	Kuopio	46	12	5	51	22	14	89	24	10	185	58	28
402	Lapinlahti	28	7	3	20	9	6	38	11	5	86	27	13
420	Leppävirta	52	13	5	50	21	14	97	26	10	200	60	29
476	Maaninka	24	6	2	19	9	6	27	8	3	69	22	11
534	Nilsia	31	8	3	29	13	8	46	13	5	105	34	16
595	Pielavesi	69	16	6	42	20	14	63	18	8	174	54	28
686	Rautalampi	30	7	3	24	10	7	42	11	4	96	28	14
687	Rautavaara	54	14	5	29	14	10	83	25	10	166	53	25
749	Sillinjärvi	14	4	1	13	6	4	22	6	2	49	16	7
762	Sonkajärvi	62	15	6	31	15	10	98	30	13	190	60	29
778	Suonenjoki	36	9	4	28	11	7	47	13	5	111	33	16
844	Tervo	20	5	2	16	7	5	21	6	2	57	18	9
857	Tuusniemi	20	5	2	25	11	7	34	10	4	79	26	13
915	Varkaus	31	7	2	17	6	4	25	7	3	73	20	9
916	Varpaisjärvi	20	5	2	15	7	5	30	9	4	65	21	10
921	Vesanto	25	6	2	19	8	6	22	6	3	66	20	10
925	Vieremä	40	9	4	18	9	6	61	19	8	119	37	18
Total		789	189	75	577	261	170	1,084	312	127	2,450	762	372
<b>Pohjois-Karjala</b>													
<i>Municipality</i>													
45	Eno	52	12	5	46	25	20	49	14	5	148	51	29
146	Ilomantsi	335	75	30	59	30	18	128	40	19	522	145	68
167	Joensuu	95	22	9	76	34	21	77	23	8	248	78	37
176	Juuka	163	38	15	42	18	11	79	24	9	283	80	35
248	Kesälahti	46	10	4	27	10	6	30	9	4	103	29	14
260	Kitee	77	19	7	62	26	16	56	17	8	195	62	31

(continued)

Table 8a (continued)

	Pine						Spruce						Deciduous tree species						All tree species					
	Stem and bark			Foliage			Stem and bark			Foliage			Stem and bark			Foliage			Stem and bark			Foliage		
	Branches	Stem and bark	Foliage	Branches	Stem and bark	Foliage	Branches	Stem and bark	Foliage	Branches	Stem and bark	Foliage	Branches	Stem and bark	Foliage	Branches	Stem and bark	Foliage	Branches	Stem and bark	Foliage			
	(1,000t)																							
276	60	13	5	22	9	6	64	17	6	146	39	17	6	146	39	17	6	146	39	17	6			
309	29	7	2	31	12	8	63	17	7	123	37	16	7	123	37	16	7	123	37	16	7			
422	408	93	36	72	36	23	168	51	24	648	180	83	24	648	180	83	24	648	180	83	24			
426	52	11	4	34	14	9	24	7	3	110	32	16	3	110	32	16	3	110	32	16	3			
541	136	33	13	36	17	11	66	20	8	237	70	32	8	237	70	32	8	237	70	32	8			
607	89	19	7	40	16	11	85	23	8	214	58	26	8	214	58	26	8	214	58	26	8			
632	7	2	1	15	7	4	16	4	2	38	13	7	2	38	13	7	2	38	13	7	2			
707	12	3	1	29	12	7	35	9	4	76	23	11	4	76	23	11	4	76	23	11	4			
848	91	23	9	56	22	13	40	12	5	187	57	27	5	187	57	27	5	187	57	27	5			
911	51	13	5	19	8	5	34	10	4	104	31	14	4	104	31	14	4	104	31	14	4			
Total	1,703	391	151	665	296	189	1,014	298	122	3,382	985	462	122	3,382	985	462	122	3,382	985	462	122			
<b>Kainuu</b>																								
<i>Municipality</i>																								
105	93	25	10	20	10	7	53	17	7	166	52	24	7	166	52	24	7	166	52	24	7			
205	166	43	17	23	11	7	144	46	19	333	100	43	19	333	100	43	19	333	100	43	19			
290	383	96	37	55	28	19	144	48	21	582	171	78	21	582	171	78	21	582	171	78	21			
578	72	17	7	18	8	5	64	19	8	154	45	20	8	154	45	20	8	154	45	20	8			
620	82	23	9	22	11	7	66	22	9	170	56	25	9	170	56	25	9	170	56	25	9			
697	69	19	7	16	8	5	36	12	5	122	39	17	5	122	39	17	5	122	39	17	5			
765	240	61	24	51	24	15	194	61	24	485	146	63	24	485	146	63	24	485	146	63	24			
777	169	47	20	28	15	10	92	31	17	289	93	46	17	289	93	46	17	289	93	46	17			
785	87	23	10	8	4	2	56	18	7	151	45	19	7	151	45	19	7	151	45	19	7			
Total	1,361	354	141	242	118	77	849	275	116	2,452	747	334	116	2,452	747	334	116	2,452	747	334	116			

**Pohjois-Pohjanmaa***Municipality*

9	Alavieska	16	4	2	2	1	1	7	2	1	26	8	3
69	Haapajärvi	77	17	7	19	8	6	64	19	9	159	44	21
71	Haapavesi	86	20	8	24	12	8	115	33	13	226	64	28
72	Hailuoto	6	1	1	1	0	0	21	6	3	27	8	4
84	Haukipudas	29	7	3	6	3	2	32	9	3	67	19	8
139	Ii	94	25	10	28	13	9	150	45	18	272	84	36
208	Kalajohti	44	12	5	4	2	2	29	9	3	77	23	10
244	Kempele	7	2	1	1	0	0	13	4	2	20	6	3
247	Kestli	57	16	7	2	1	1	41	12	5	100	29	13
255	Kiiminki	28	7	3	5	2	2	22	7	3	55	16	7
305	Kuusamo	116	35	15	19	10	6	74	25	10	209	71	31
317	Kärsämäki	67	16	6	20	9	5	90	26	10	177	50	22
425	Luminka	37	10	5	2	1	1	62	19	8	101	30	13
436	Lumijoki	10	3	1	1	0	0	35	10	4	46	13	6
483	Merijärvi	20	5	2	4	2	1	12	4	1	36	10	5
494	Muhos	60	16	7	4	2	1	48	15	6	113	33	14
535	Nivala	24	5	2	7	3	2	26	7	3	57	16	7
563	Oulainen	44	10	4	10	4	3	44	13	5	98	27	12
564	Oulu	25	6	3	4	2	1	24	7	3	53	15	7
567	Oulunsalo	12	3	1	2	1	1	16	5	2	30	9	4
603	Piippola	51	14	6	6	3	2	46	14	6	102	30	13
615	Pudasjärvi	270	73	29	39	20	13	129	43	18	438	137	60
617	Pulkila	45	12	5	4	2	1	37	11	5	87	25	11
625	Pyhäjoki	38	10	4	5	3	2	37	11	4	80	24	10
626	Pyhäsalmi	120	26	10	44	21	14	135	39	17	299	86	41
630	Pyhäntä	83	21	9	6	3	2	53	16	7	142	40	18
678	Raabe	36	10	4	3	2	2	52	15	6	92	27	12
682	Rantasila	68	19	8	3	1	1	55	16	7	125	36	16

(continued)

Table 8a (continued)

	Pine				Spruce				Deciduous tree species				All tree species			
	Stem and bark		Foliage		Stem and bark		Foliage		Stem and bark		Foliage		Stem and bark		Foliage	
	Branches	Stem and bark	Branches	Foliage	Branches	Stem and bark	Branches	Foliage	Branches	Stem and bark	Branches	Foliage	Branches	Stem and bark	Branches	Foliage
691	16	8	6	6	4	27	2	5	8	106	28	14	28	106	28	14
746	17	6	6	6	4	46	3	7	14	125	34	16	34	125	34	16
748	17	8	8	8	2	110	2	14	33	179	52	23	52	179	52	23
832	28	11	11	11	10	42	6	6	14	156	52	23	52	156	52	23
859	8	3	3	3	1	31	0	4	9	60	17	8	17	60	17	8
889	29	12	12	12	4	72	3	9	23	200	56	24	56	200	56	24
926	10	4	4	4	2	34	1	4	10	74	21	9	21	74	21	9
972	13	5	5	5	6	48	4	6	15	109	34	15	34	109	34	15
973	26	11	11	11	6	62	4	7	19	178	52	22	52	178	52	22
977	10	4	4	4	2	34	2	4	10	82	22	10	22	82	22	10
Total	580	237	237	237	173	1,975	115	247	596	4,579	1,348	598	1,348	4,579	1,348	598
<b>Lapland</b>																
<i>Municipality</i>																
47	1	0	0	0	0	4	0	1	2	6	2	1	2	6	2	1
148	45	23	23	23	1	1	0	0	0	130	46	24	46	130	46	24
240	1	0	0	0	1	7	0	1	2	10	3	1	3	10	3	1
241	4	2	2	2	12	56	8	7	18	91	34	16	34	91	34	16
261	23	10	10	10	8	33	6	6	13	138	44	21	44	138	44	21
273	19	9	9	9	8	33	6	6	12	119	40	20	40	119	40	20
320	50	22	22	22	15	60	11	10	21	250	86	42	86	250	86	42
498	4	2	2	2	1	9	1	2	4	26	8	4	8	26	8	4
583	19	8	8	8	10	52	7	8	18	133	47	23	47	133	47	23
614	49	20	20	20	7	38	5	6	14	203	70	30	70	203	70	30

683	Ranua	106	31	13	24	14	9	42	15	7	172	59	29
698	Rovaniemi	297	79	33	67	37	24	158	58	25	522	173	82
732	Salla	213	67	27	41	23	15	104	37	15	358	127	58
742	Savukoski	191	57	24	17	10	7	46	17	8	254	84	39
751	Simo	52	16	7	18	10	7	86	28	11	156	54	25
758	Sodankylä	116	33	13	13	7	5	35	13	8	165	54	26
845	Tervola	62	18	8	40	22	15	118	41	18	220	81	40
851	Tornio	23	7	3	50	26	16	112	38	15	185	71	34
854	Pello	58	16	7	17	9	6	42	15	7	117	40	20
890	Utsjoki	0	0	0	-	-	-	0	0	0	0	0	0
976	Ylitornio	80	23	11	26	14	10	98	36	15	204	73	35
Total		1,899	560	242	424	236	156	1,134	401	174	3,457	1,198	571

**Table 8b** The biomass by tree species of the tree compartments available for energy wood in mature stands (forest land) (By forestry centres).

Åland Municipality	Pine		Spruce		Deciduous tree species		All tree species	
	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots
35	6	5	0	0	61	21	67	26
43	24	27	22	13	13	7	60	47
60	23	25	23	15	14	7	60	47
62	29	27	13	8	16	7	58	42
65	14	15	12	7	7	4	33	26
76	26	28	22	14	18	9	66	51
170	29	33	31	19	16	9	77	61
295	13	11	3	2	25	10	41	23
318	3	2	0	0	7	2	10	4
417	22	24	23	14	14	8	60	46
438	8	8	6	4	4	2	18	14
478	1	1	1	1	1	0	3	2
736	29	30	25	15	16	8	69	53
766	3	2	1	1	5	2	9	5
771	21	22	19	12	13	6	53	40
941	17	17	12	7	13	5	41	29
Total	269	277	214	134	245	105	727	516

(1,000t)



Table 8b (continued)

	Pine			Spruce			Deciduous tree species			All tree species		
	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots
	(1,000t)											
<b>Rannikko/Pohjanmaa</b>												
<i>Municipality</i>												
231	1	1	3	2	1	0	5	4				
	Kaskinen-Kaskö											
272	27	30	70	46	23	12	120	87				
	Kokkola-Karleby											
280	13	16	81	50	28	11	122	77				
	Korsnäs											
287	54	65	218	148	43	18	314	230				
	Kristinestad-											
	Kristinankaupunki											
288	74	80	124	83	34	17	233	180				
	Kronoby-Kruunupyy											
440	13	14	31	19	12	7	56	40				
	Larsmo-Luoto											
475	29	37	136	87	53	26	218	150				
	Malax-Maalathi											
499	51	63	297	201	68	32	415	296				
	Korsholm-Mustasaari											
545	68	83	295	198	61	26	425	307				
	Närpes-Närpiö											
559	16	17	51	33	17	8	84	58				
	Oravais-Oravainen											
598	7	6	17	10	10	5	34	21				
	Jakobstad-Pietarsaari											
599	62	71	147	92	58	29	267	192				
	Pedersöre-Pedersören kunta											
893	51	55	147	87	45	21	243	163				
	Nykarleby-Uusikaarlepyy											
905	10	12	72	48	11	5	93	66				
	Vaasa-Vasa											
945	48	55	195	130	68	31	311	216				
	Vörå-Maxmo-Vöyri-											
	Maksamaa											
Total	524	604	1,884	1,235	533	247	2,940	2,087				



**Lounais-Suomi***Municipality*

6	Alastaro	19	25	46	36	10	3	74	64
17	Askainen	9	10	6	4	2	1	17	15
19	Aura	10	14	18	13	3	2	32	28
50	Eura	46	60	93	68	18	6	157	135
51	Eurajoki	34	44	71	52	17	7	122	103
73	Halikko	40	53	52	37	12	6	104	96
79	Harjavalta	9	13	15	12	4	1	29	26
99	Honkajoki	31	35	9	6	9	3	49	43
102	Huittinen	19	26	79	66	12	5	110	97
181	Jämijärvi	15	18	28	19	8	3	50	40
202	Kaarina	6	6	5	3	1	0	11	9
214	Kankaanpää	52	66	75	50	25	9	152	125
230	Karvia	41	46	21	16	16	5	78	67
252	Kirkkala	40	51	66	48	13	6	119	105
254	Kiikoinen	8	11	33	25	7	4	49	40
259	Kisko	45	57	69	47	14	6	128	111
262	Kiukainen	9	12	22	16	4	2	35	30
271	Kokemäki	38	51	84	65	17	7	138	123
284	Koski Tl	11	16	42	33	7	2	60	52
304	Kustavi	30	32	19	10	12	5	61	46
308	Kuusjoki	12	16	23	18	5	2	40	35
319	Köyliö	24	32	53	38	8	3	86	73
400	Laitila	66	84	107	74	24	8	197	166
406	Lappi	26	32	44	32	9	3	79	68
413	Lavia	27	36	57	38	18	9	102	83
419	Lemu	5	5	4	3	1	1	10	9
423	Lieto	26	33	38	26	6	3	69	62
430	Loimaa	22	31	99	78	14	5	134	114
442	Luvia	13	10	67	50	17	7	97	67
480	Marttila	19	26	39	29	10	4	68	58
481	Masku	12	13	13	8	3	1	27	23

(continued)

Table 8b (continued)

	Pine		Spruce		Deciduous tree species		All tree species	
	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots
	(1,000t)							
482	4	6	15	12	3	1	23	19
484	39	49	68	45	20	8	126	101
485	10	11	7	4	2	1	19	16
501	11	15	15	10	3	1	29	26
503	56	71	97	69	18	6	171	146
529	8	9	5	3	1	1	15	13
531	8	12	31	25	4	2	44	38
537	33	43	95	70	26	12	154	125
538	25	32	48	35	7	2	80	70
561	12	15	24	16	6	2	41	33
577	30	38	28	19	5	2	63	59
586	64	82	86	60	17	7	167	149
587	18	24	27	19	6	3	50	45
602	10	12	9	6	2	1	21	19
608	39	53	103	72	28	12	171	138
609	35	38	135	100	31	14	201	153
631	23	29	32	19	11	4	65	51
636	48	62	94	65	20	8	161	136
680	5	5	4	3	1	0	11	8
684	38	47	52	35	16	6	106	88
704	6	7	7	4	2	1	14	12
705	26	27	17	9	8	3	51	39
734	17	22	24	16	5	2	46	41

738	Sauvo	29	33	29	18	8	3	65	55
747	Siikainen	38	50	67	42	18	7	123	99
761	Somero	53	70	153	121	26	11	231	201
776	Suomusjärvi	28	35	45	34	6	3	80	72
783	Säkylä	20	26	36	26	5	2	62	53
784	Särkisalo-Finby	13	17	16	11	5	2	35	31
833	Taivassalo	21	23	13	7	5	2	39	32
838	Tarvasjoki	11	14	18	12	3	2	32	28
853	Turku-Abo	23	26	20	13	6	2	49	41
886	Uvila	33	44	83	60	24	11	140	115
895	Uusikaupunki	75	86	62	39	23	8	160	134
906	Vahto	9	11	18	13	3	1	29	25
913	Vampula	9	12	30	24	7	3	45	39
918	Vehmaa	22	25	18	10	4	2	45	37
920	Velkua	6	5	3	2	2	1	12	8
979	Yläne	42	54	84	61	14	5	140	120
Total		1,763	2,203	3,114	2,234	726	290	5,603	4,727
<b>Häme-Uusimaa</b>									
<i>Municipality</i>									
15	Artjärvi	13	19	55	33	14	6	82	58
16	Asikkala	51	75	142	114	53	33	246	222
18	Askola	21	30	66	45	25	9	113	85
61	Forssa	8	11	73	53	6	4	87	69
81	Hartola	48	76	65	53	82	44	196	173
82	Hattula	15	22	77	57	15	12	107	91
83	Hauho	27	41	83	63	10	7	119	110
86	Hausjärvi	13	18	90	70	25	14	128	103
98	Hollola	27	38	119	93	30	15	176	146
103	Hummppila	2	3	36	1	0	0	39	31
106	Hyvinkää	12	17	84	69	22	11	118	97
109	Hämeenlinna	9	12	36	27	7	5	52	44
111	Heinola	123	170	91	68	106	52	320	290

(continued)

Table 8b (continued)

	Pine		Spruce		Deciduous tree species		All tree species	
	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots
	(1,000t)							
165	29	38	145	116	30	18	204	172
169	5	7	42	32	4	3	52	42
186	1	1	5	4	1	1	7	6
210	11	15	88	67	8	6	107	88
223	15	18	20	15	2	1	37	34
224	16	19	76	58	20	13	112	90
245	1	2	5	4	1	1	7	7
283	9	12	39	28	9	5	56	45
316	8	11	63	48	13	8	83	67
398	8	11	27	20	10	5	44	36
401	37	49	132	103	22	13	190	164
433	32	37	177	141	44	26	253	204
444	25	33	72	50	15	13	112	96
504	20	29	67	41	24	10	110	80
505	19	28	196	156	37	22	252	206
532	32	48	53	37	36	21	121	106
540	34	44	81	61	23	17	138	122
543	13	18	68	52	22	13	103	83
560	36	53	166	118	45	20	247	191
576	61	87	196	159	36	17	293	263
611	9	13	36	27	14	5	58	45
616	7	10	37	28	11	5	55	42
692	17	21	81	60	17	12	115	94

694	Riihimäki	3	5	32	26	8	4	44	35
737	Sammatti	7	9	11	7	2	1	20	18
781	Syvä	70	103	89	70	76	43	235	216
834	Tammela	33	45	169	130	30	22	231	197
855	Tuulos	11	14	39	30	5	3	55	47
858	Tuusula	6	9	46	36	9	5	61	51
927	Vihti	43	56	135	91	47	34	225	181
981	Ypäjä	4	6	40	29	2	1	47	36
Total		990	1,383	3,448	2,619	1,019	582	5,457	4,584
<b>Kaakkois-Suomi</b>									
<i>Municipality</i>									
44	Elimäki	23	31	96	75	23	15	141	121
75	Hamina	67	90	164	116	42	15	273	221
142	Iitti	45	60	151	112	50	24	246	197
153	Imatra	13	18	18	14	19	12	50	44
163	Jaala	75	106	97	64	78	40	250	210
173	Joutseno	30	42	40	30	42	27	112	99
285	Kotka	25	33	48	32	26	12	99	78
286	Kouvola	2	3	6	4	2	1	10	8
306	Kuusankoski	8	11	24	18	8	3	40	32
405	Lappeenranta	68	97	184	143	57	32	309	272
416	Lemi	28	40	50	37	27	15	105	92
441	Luumäki	81	116	212	156	55	26	348	298
489	Miehikkälä	37	53	94	70	13	6	144	128
580	Parikkala	44	67	67	48	62	31	173	146
624	Pyhtää-Pyttis	23	32	57	42	33	20	114	94
689	Rautjärvi	38	57	57	41	53	30	148	128
700	Ruokolahti	122	181	175	126	132	73	429	381
739	Savitaipale	82	120	136	97	87	51	306	268
754	Anjalankoski	60	83	170	122	51	22	281	226
775	Suomenniemi	56	82	67	43	54	32	178	157
831	Taipalsaari	57	80	45	33	61	37	163	149

(continued)

Table 8b (continued)

	Pine			Spruce			Deciduous tree species			All tree species		
	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots
	(1,000 t)											
909	106	151	201	140	89	44	397	335				
935	35	47	67	50	14	6	116	103				
978	32	45	93	68	12	6	136	119				
Total	1,158	1,644	2,318	1,680	1,091	579	4,567	3,904				
<b>Pirkanmaa</b>												
<i>Municipality</i>												
20	3	5	17	13	4	2	24	20				
108	25	35	116	86	28	14	170	135				
143	58	75	175	124	42	19	274	218				
177	18	25	84	63	18	8	120	95				
211	30	42	124	94	33	15	186	151				
250	28	35	35	22	22	8	85	66				
289	11	15	52	40	13	6	77	62				
303	68	89	192	133	47	19	307	241				
310	9	13	46	34	7	4	63	51				
418	14	20	87	67	19	10	120	97				
493	15	21	62	45	14	6	91	72				
506	5	7	17	13	4	2	26	23				
536	17	24	77	55	17	8	111	88				
562	53	73	267	201	54	26	374	300				
581	74	92	106	71	41	14	221	177				
604	4	6	22	16	5	3	31	25				

619	Punkalaidun	2	3	10	8	1	0	14	12
635	Päikkäne	39	57	153	114	48	26	240	197
702	Ruovesi	78	107	263	194	55	22	396	323
837	Tampere	33	45	159	121	38	18	229	184
887	Urijala	25	36	128	94	21	12	175	142
908	Valkeakoski	12	17	64	50	15	8	91	75
912	Vammala	51	68	208	155	43	19	302	242
922	Vesilähti	19	27	125	95	19	10	163	132
933	Vilppula	49	71	157	119	33	15	238	205
936	Virrät	105	136	212	147	76	29	393	313
980	Ylöjärvi	25	35	119	89	26	12	170	136
988	Äetsä	15	20	50	37	11	4	76	61
Total		884	1,198	3,126	2,301	755	342	4,765	3,841
<b>Etelä-Savo</b>									
<i>Municipality</i>									
46	Enonkoski	40	60	77	56	34	18	151	134
90	Heinävesi	72	113	212	151	92	49	376	313
97	Hirvensalmi	68	99	56	40	103	61	227	200
171	Joroinen	42	67	164	124	45	24	252	215
178	Juva	114	177	275	211	123	70	512	458
213	Kangasniemi	125	201	256	189	127	72	508	462
246	Kerimäki	65	95	80	55	55	34	200	184
491	Mikkeli	202	322	305	235	246	138	753	695
507	Mäntyharju	138	217	128	84	135	76	401	377
588	Pertunmaa	36	57	48	35	70	43	154	135
593	Pieksämäki	118	184	438	322	118	62	673	567
618	Punkaharju	72	108	97	67	63	28	232	203
623	Puumala	114	166	69	44	143	69	326	280
681	Rantasalmi	36	57	98	77	53	24	188	157
696	Ristiina	78	121	72	53	101	58	251	232
740	Savonlinna	91	134	73	49	104	61	268	244

(continued)

Table 8b (continued)

	Pine		Spruce		Deciduous tree species		All tree species	
	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots
741	40	62	88	69	43	26	171	157
768	72	103	68	50	66	39	205	192
Total	1,523	2,342	2,604	1,911	1,721	952	5,848	5,206
(1,000t)								
<b>Etelä-Pohjanmaa</b>								
<i>Municipality</i>								
4	20	25	28	17	15	7	62	49
5	61	72	63	45	24	10	148	126
10	83	98	80	56	29	12	192	166
52	37	42	41	28	16	8	94	78
74	23	24	7	4	6	2	36	29
95	19	21	30	20	9	6	58	47
145	39	47	186	122	49	18	274	187
151	66	77	133	95	50	22	250	193
152	18	21	76	49	24	10	118	79
164	77	87	110	73	43	16	230	176
175	39	44	137	91	28	12	204	148
217	25	27	31	20	9	5	65	53
218	19	22	47	29	11	5	77	56
232	91	102	103	67	52	24	246	193
233	41	48	48	34	19	8	108	90
236	22	23	21	14	2	1	44	38



281	Kortesjärvi	28	34	39	27	13	6	81	67
300	Kuortane	68	84	66	46	19	8	153	138
301	Kurikka	44	53	93	59	32	11	169	123
315	Kälviä	52	53	62	42	14	8	128	103
399	Laihia	39	44	150	102	47	18	236	164
403	Lappajärvi	33	39	42	31	21	8	97	78
408	Lapua	62	73	101	67	42	16	204	157
414	Lehtimäki	28	34	30	22	8	4	66	59
421	Lestijärvi	38	41	30	21	8	4	77	66
429	Lohtaja	29	32	35	23	9	5	73	60
544	Nurmo	28	32	53	35	22	8	103	75
584	Perho	28	30	10	8	6	1	44	39
743	Seinäjoki	39	46	55	38	25	10	119	93
759	Soini	47	55	77	53	24	8	148	115
846	Teuva	45	53	147	92	24	11	215	155
849	Toholampi	39	42	37	25	4	4	80	71
863	Töysä	54	62	44	32	10	5	108	99
885	Ullava	13	13	12	8	2	1	26	22
924	Veteli	30	32	47	34	23	5	100	71
934	Vimpeli	19	22	25	18	14	5	58	45
942	Vähäkylä	11	12	41	27	17	7	69	46
971	Ylihärmä	10	11	15	9	8	3	33	23
975	Ylistaro	37	42	111	70	37	11	185	123
989	Ähtäri	109	122	124	84	42	19	275	225
Total		1,607	1,841	2,587	1,736	859	351	5,053	3,928

(continued)

Table 8b (continued)

	Pine		Spruce		Deciduous tree species		All tree species	
	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots
	(1,000t)							
<b>Keski-Suomi</b>								
<i>Municipality</i>								
77	46	70	169	128	60	26	276	224
172	35	53	122	95	57	27	214	175
179	6	9	23	18	9	4	39	32
180	36	51	120	95	46	20	202	167
182	99	142	373	280	108	45	580	467
183	31	44	91	69	37	16	158	129
216	42	55	91	67	38	13	170	136
226	64	82	130	92	57	18	251	191
249	81	110	177	129	50	19	307	258
256	28	35	50	34	27	7	105	76
265	45	58	82	56	37	11	163	125
275	42	61	144	111	53	22	239	194
277	52	74	181	142	66	30	300	245
291	64	92	220	162	70	29	353	283
312	30	37	44	29	20	6	94	71
410	50	73	165	128	61	26	276	227
415	34	46	100	76	35	16	169	138
435	16	23	54	42	26	12	96	77
495	57	76	137	100	49	17	243	192
500	11	16	40	31	15	7	65	53

592	Petäjavesi	38	54	113	88	45	19	196	160
601	Pihlupudas	71	92	192	133	77	24	341	250
633	Pylikönmäki	28	36	59	42	23	8	110	86
729	Saarijärvi	78	109	213	164	80	30	371	302
850	Toivakka	32	46	94	72	37	17	163	135
892	Uurainen	29	41	87	69	36	15	152	124
931	Viitasaari	96	134	327	241	116	44	539	419
992	Äänekoski	77	111	209	163	84	36	371	310
	<b>Total</b>	<b>1,318</b>	<b>1,829</b>	<b>3,808</b>	<b>2,855</b>	<b>1,416</b>	<b>564</b>	<b>6,543</b>	<b>5247</b>
<b>Pohjois-Savo</b>									
<i>Municipality</i>									
140	Iisalmi	30	41	252	182	40	19	322	242
174	Juankoski	28	40	153	111	32	14	213	165
204	Kaavi	48	69	195	142	55	24	299	235
227	Karttula	34	50	133	99	50	22	216	172
239	Keitele	30	41	125	92	43	16	198	149
263	Kiuruvesi	40	53	270	189	56	25	366	267
297	Kuopio	84	127	380	280	119	53	583	460
402	Lapinlahti	25	35	207	153	40	18	272	206
420	Leppävirta	93	150	419	297	137	65	649	512
476	Maaninka	22	32	163	121	36	15	222	168
534	Niisjä	35	50	262	194	45	20	342	263
595	Pielavesi	56	78	346	250	86	38	489	366
686	Rautalampi	44	66	129	96	52	23	225	185
687	Rautavaara	46	58	247	172	46	27	339	257
749	Sillinjärvi	18	26	122	90	30	12	170	128
762	Sonkajärvi	57	71	323	226	53	26	432	324
778	Suonenjoki	61	94	212	156	79	35	352	286
844	Tervo	23	34	96	71	30	13	148	117
857	Tuusniemi	41	62	173	123	53	25	267	211

(continued)

Table 8b (continued)

	Pine			Spruce			Deciduous tree species			All tree species		
	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots
	(1,000t)											
915	28	44	90	72	36	17	154	133				
916	21	29	166	122	31	15	219	166				
921	29	42	114	86	37	16	180	144				
925	37	48	191	135	39	17	267	200				
Total	931	1,340	4,769	3,460	1,225	555	6,924	5,355				
<b>Pohjois-Karjala Municipality</b>												
45	51	80	206	122	39	29	295	232				
146	178	226	358	233	97	58	633	518				
167	87	130	328	212	73	45	489	387				
176	103	128	346	235	82	41	530	404				
248	37	53	26	18	39	19	101	90				
260	77	117	200	133	54	34	331	284				
276	86	130	139	103	67	29	292	261				
309	39	59	64	50	61	23	164	132				
422	463	481	523	343	192	84	1,178	908				
426	59	87	74	58	38	20	171	165				
541	120	152	368	237	140	67	628	456				
607	36	56	120	88	76	23	232	166				
632	16	25	37	31	23	14	76	70				
707	31	49	59	44	32	14	122	107				

848	Tohmajärvi	57	90	197	152	34	20	288	262
911	Valtimo	27	36	138	89	79	33	245	158
Total		1,468	1,898	3,182	2,147	1,125	555	5,775	4,599
<b>Kainuu</b>									
<i>Municipality</i>									
105	Hyrnysalmi	131	152	376	229	75	29	582	410
205	Kajaani	164	187	130	85	50	19	343	291
290	Kuhmo	599	760	1,082	644	225	101	1,906	1,506
578	Paltamo	69	82	170	112	50	17	288	211
620	Puolanka	174	185	725	444	152	61	1,052	691
697	Ristijärvi	63	75	269	167	63	24	394	266
765	Sotkamo	218	266	527	350	125	50	870	666
777	Suomussalmi	658	694	1,431	787	291	122	2,380	1,603
785	Vaala	74	87	14	9	34	9	123	105
Total		2,150	2,487	4,723	2,828	1,064	433	7,937	5,748
<b>Pohjois-Pohjanmaa</b>									
<i>Municipality</i>									
9	Alavieska	11	13	18	12	10	5	40	30
69	Haapajärvi	46	55	55	40	45	19	147	114
71	Haapavesi	43	50	56	35	71	26	170	112
72	Hailuoto	19	14	2	1	7	3	28	18
84	Haukipudas	26	27	31	18	13	5	70	50
139	Ii	88	86	85	50	48	20	221	157
208	Kalajoki	28	28	19	11	33	13	80	53
244	Kempele	4	4	2	1	2	1	9	6
247	Kestilä	29	33	7	4	25	8	61	45
255	Kiminki	17	18	27	15	8	3	51	37
305	Kuusamo	545	545	1,326	757	290	131	2,161	1,433
317	Kärsämäki	34	42	41	28	37	17	113	87

(continued)

Table 8b (continued)

	Pine			Spruce			Deciduous tree species			All tree species		
	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots	Branches, foliage and stem residual	Stump and large roots
425	11	10	2	1	12	3	26	15				
436	5	4	2	1	5	2	12	7				
483	11	12	20	13	16	8	47	33				
494	36	37	15	9	12	3	64	50				
535	26	30	43	30	27	10	96	70				
563	31	31	58	35	53	22	141	88				
564	19	20	21	12	10	4	50	36				
567	8	8	6	3	3	1	17	12				
603	20	24	10	7	21	8	51	38				
615	296	293	655	380	190	94	1,141	768				
617	16	18	12	8	19	7	48	32				
625	19	20	20	13	45	21	84	53				
626	49	60	58	47	52	24	159	131				
630	50	59	18	13	43	17	111	88				
678	31	32	37	25	52	20	120	77				
682	24	25	13	8	25	8	61	40				
691	32	35	18	13	17	4	67	52				
746	45	48	30	21	22	8	97	77				
748	36	35	17	10	25	9	78	54				
832	175	189	697	395	168	88	1,040	673				
859	12	10	2	1	6	1	20	13				

(1,000t)

889	Utajärvi	78	85	48	28	35	9	161	122
926	Vihanti	23	24	28	17	29	10	79	50
972	Yli-Ii	36	36	26	14	13	6	75	56
973	Ylikiihimäki	39	38	57	31	13	5	108	75
977	Ylivieska	32	34	41	27	34	14	107	75
Total		2,049	2,133	3,624	2,136	1,538	657	7,211	4,926
<b>Lapland</b>									
<i>Municipality</i>									
47	Enontekiö	318	283	62	34	245	41	626	359
148	Inari	3,640	3,032	670	404	946	246	5,256	3,683
240	Kemi	1	0	8	6	1	0	10	6
241	Keminmaa	17	13	66	37	19	7	102	57
261	Kittilä	391	373	972	559	845	336	2,208	1,268
273	Kolari	194	169	241	120	173	77	609	367
320	Kemijärvi	270	258	280	146	143	55	693	460
498	Muonio	321	322	201	103	147	44	669	469
583	Pelkosenniemi	103	92	173	92	116	38	393	222
614	Posio	259	224	543	318	128	54	930	596
683	Ranua	174	145	211	107	99	38	485	290
698	Rovaniemi	473	397	721	362	363	147	1,557	906
732	Salla	407	403	1,467	847	359	141	2,233	1,391
742	Savukoski	712	702	1,139	660	421	118	2,271	1,481
751	Simo	96	80	76	44	89	29	261	153
758	Sodankylä	1,191	1,072	1,561	911	1,023	364	3,775	2,346
845	Tervola	54	45	170	88	85	35	309	169
851	Tomio	26	21	136	74	57	22	219	117
854	Pello	120	103	181	91	94	39	395	232
890	Utsjoki	2	2	8	5	5	2	16	9
976	Ylitornio	118	94	141	76	111	38	370	209
Total		8,888	7,830	9,027	5,084	5,470	1,875	23,386	14,790

## Appendix 2

# Examples of Forest Resource Maps

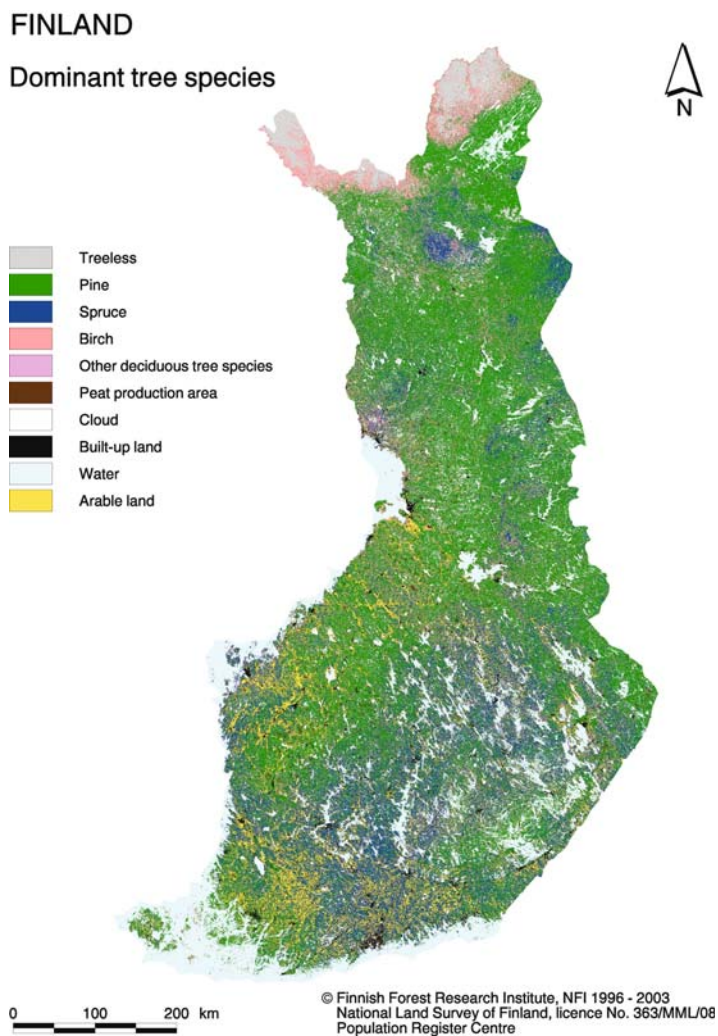


Fig. 1 Dominant tree species on forest and poorly productive forest land.



# FINLAND

## Mean volume of growing stock

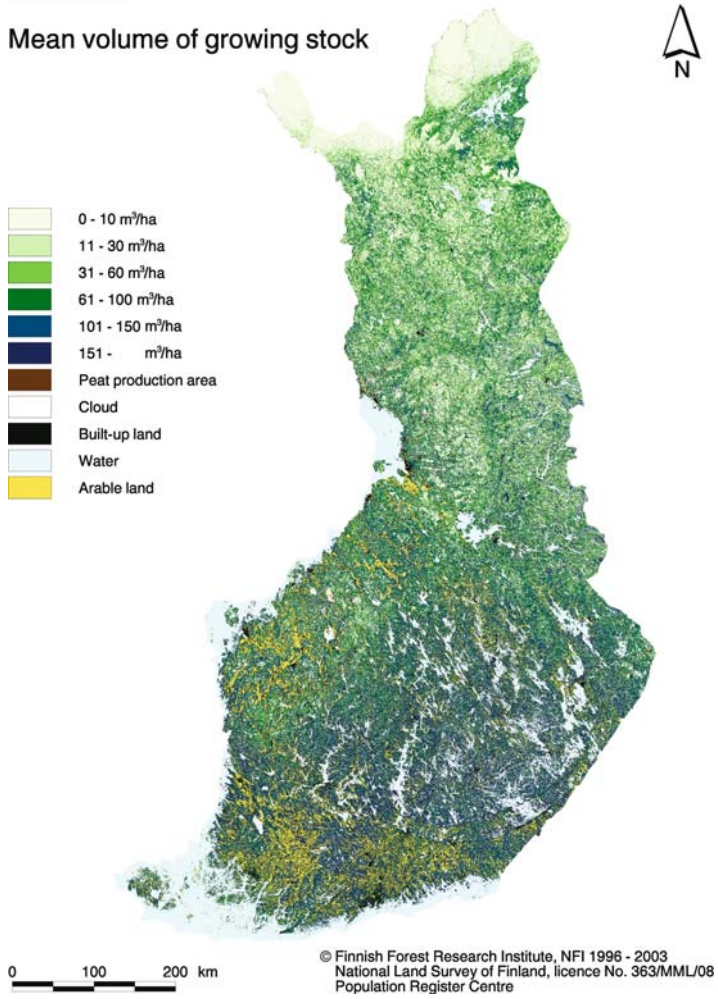
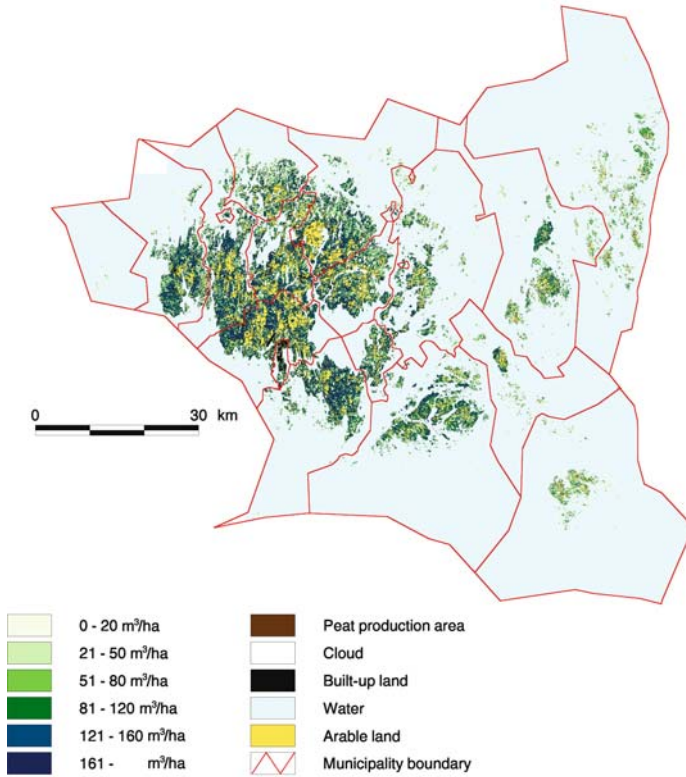


Fig. 2 The mean volume of growing stock on forest and poorly productive forest land.

# ÅLAND

## Mean volume of growing stock

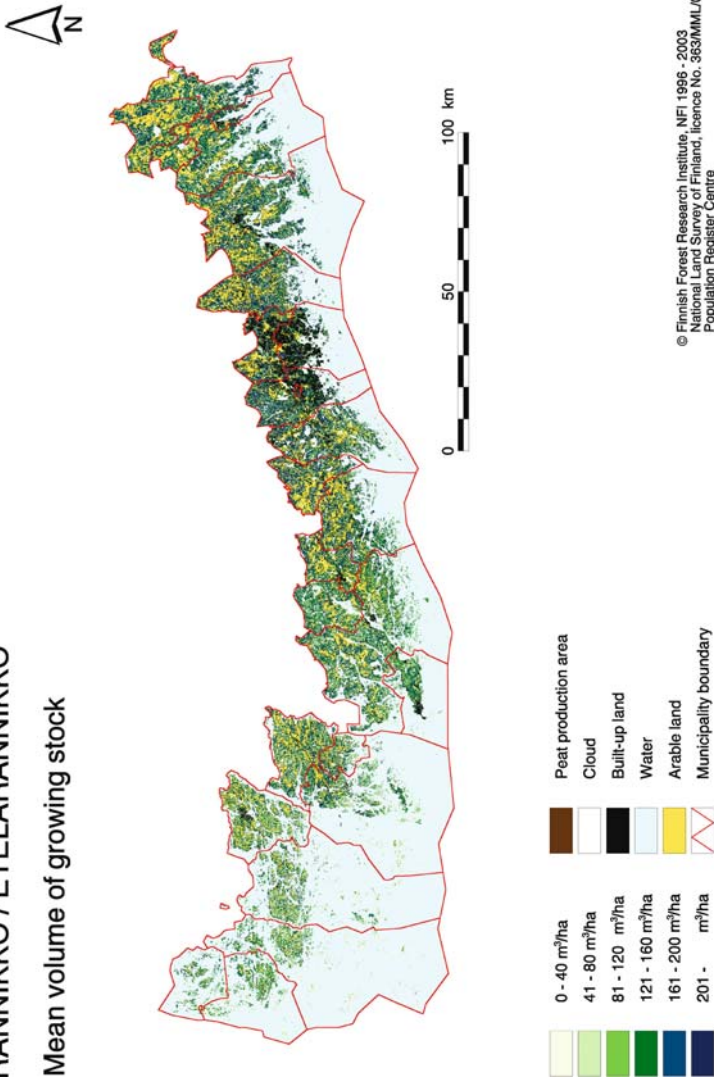


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**Fig. 3** The mean volume of growing stock on forest and poorly productive forest land in Åland.

# RANNIKKO / ETELÄRANNIKKO

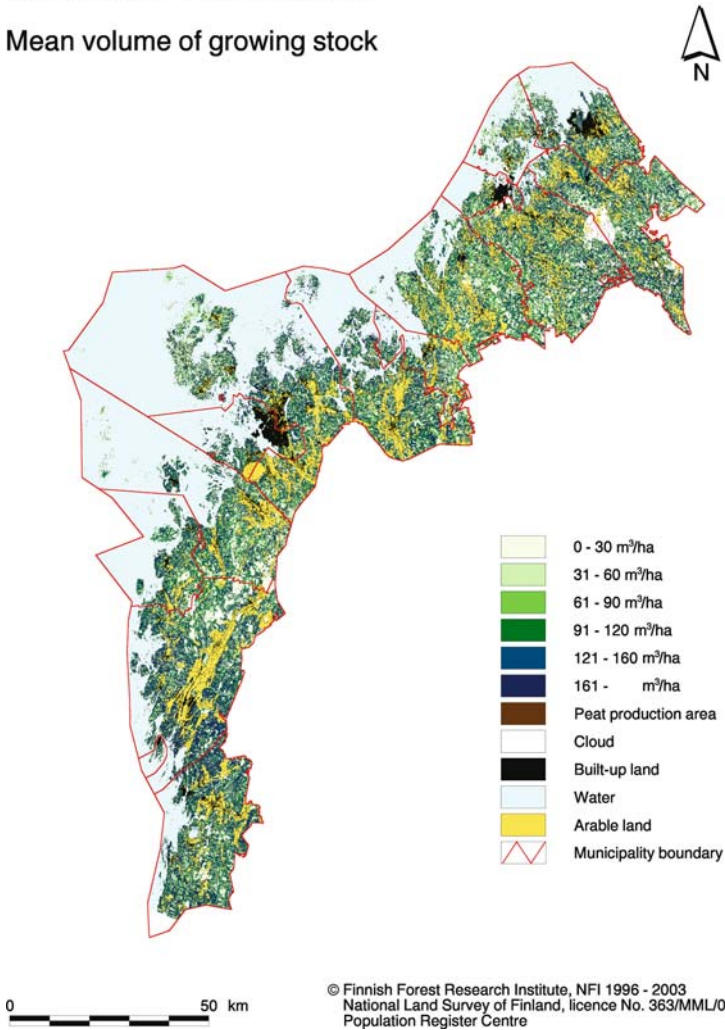
Mean volume of growing stock



**Fig. 4** The mean volume of growing stock on forest and poorly productive forest land in Etelärannikko subregion of Rannikko forestry centre.

### RANNIKKO / POHJANMAA

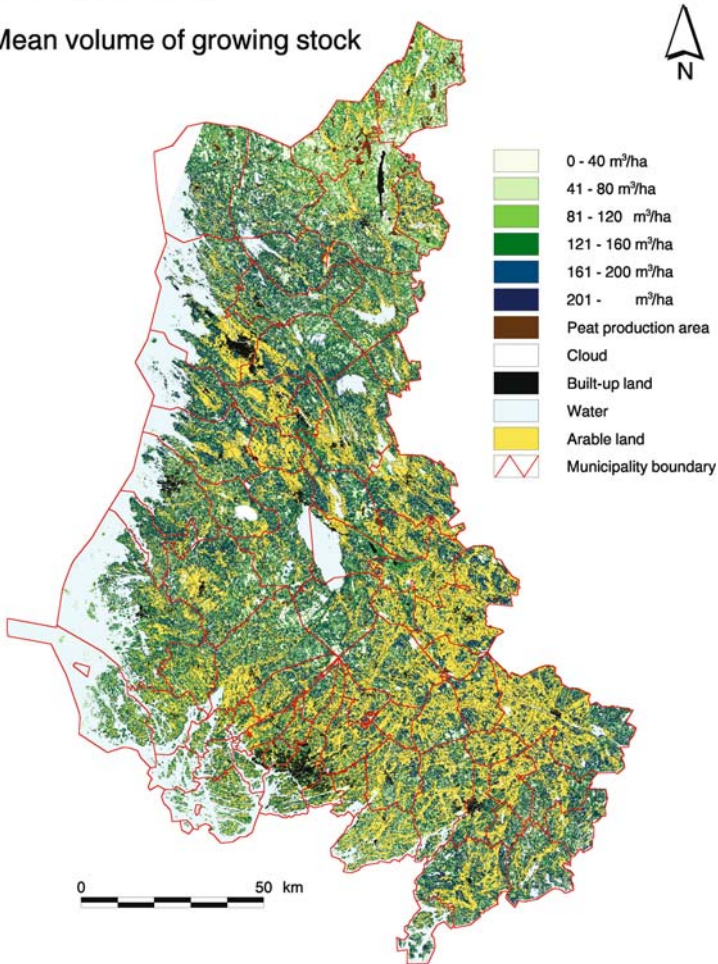
#### Mean volume of growing stock



**Fig. 5** The mean volume of growing stock on forest and poorly productive forest land in Pohjanmaan rannikko sub-region of Rannikko forestry centre.

# LOUNAIS-SUOMI

## Mean volume of growing stock

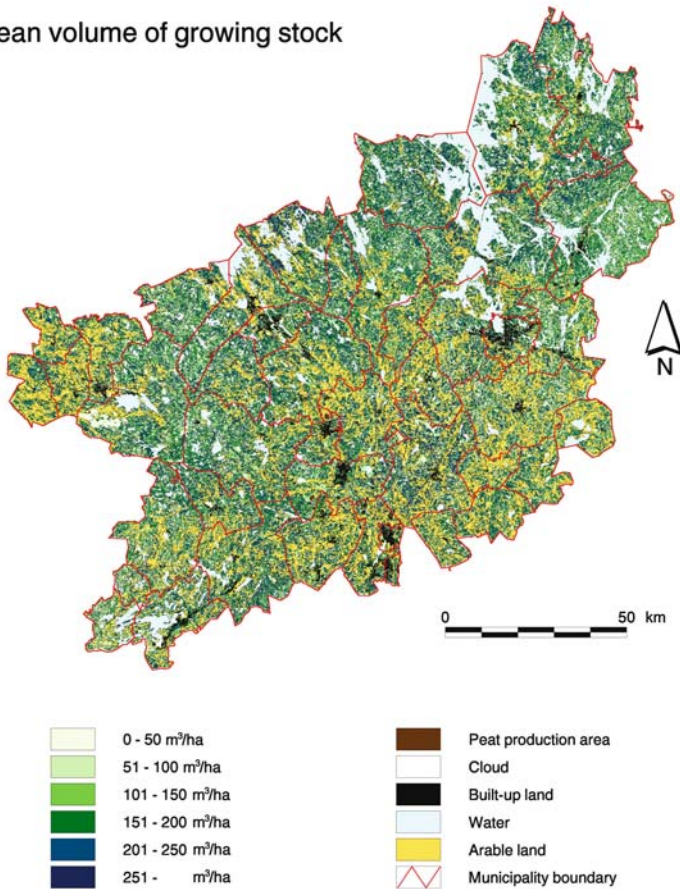


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**Fig. 6** The mean volume of growing stock on forest and poorly productive forest land in Lounais-Suomi forestry centre.

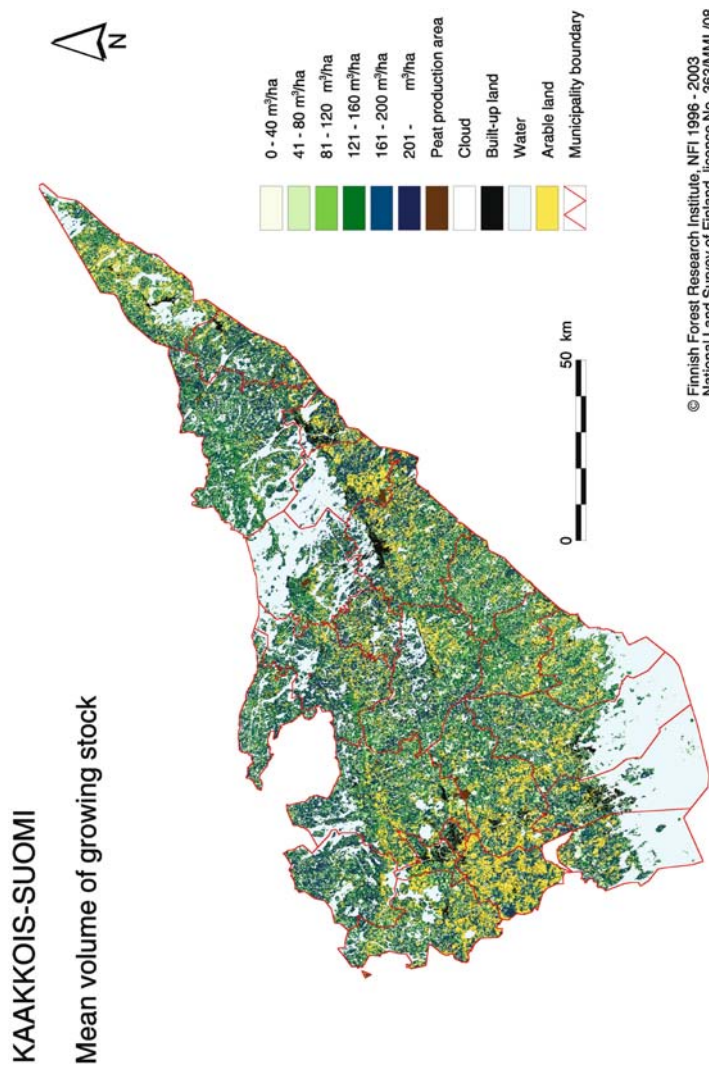
# HÄME-UUSIMAA

## Mean volume of growing stock



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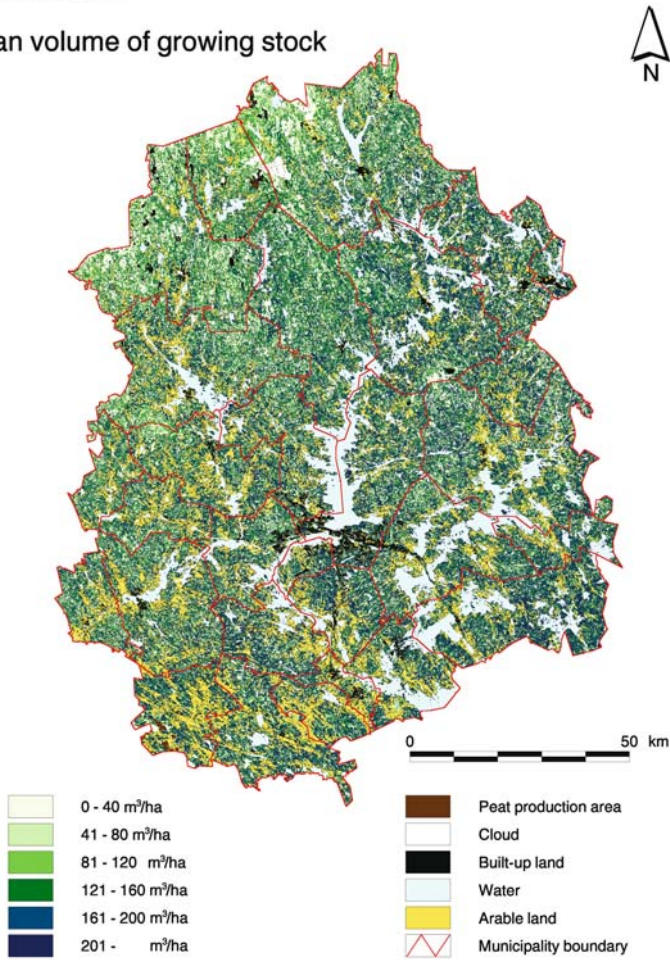
**Fig. 7** The mean volume of growing stock on forest and poorly productive forest land in Häme-Uusimaa forestry centre.



**Fig. 8** The mean volume of growing stock on forest and poorly productive forest land in Kaakkoi-Suomi forestry centre.

# PIRKANMAA

## Mean volume of growing stock



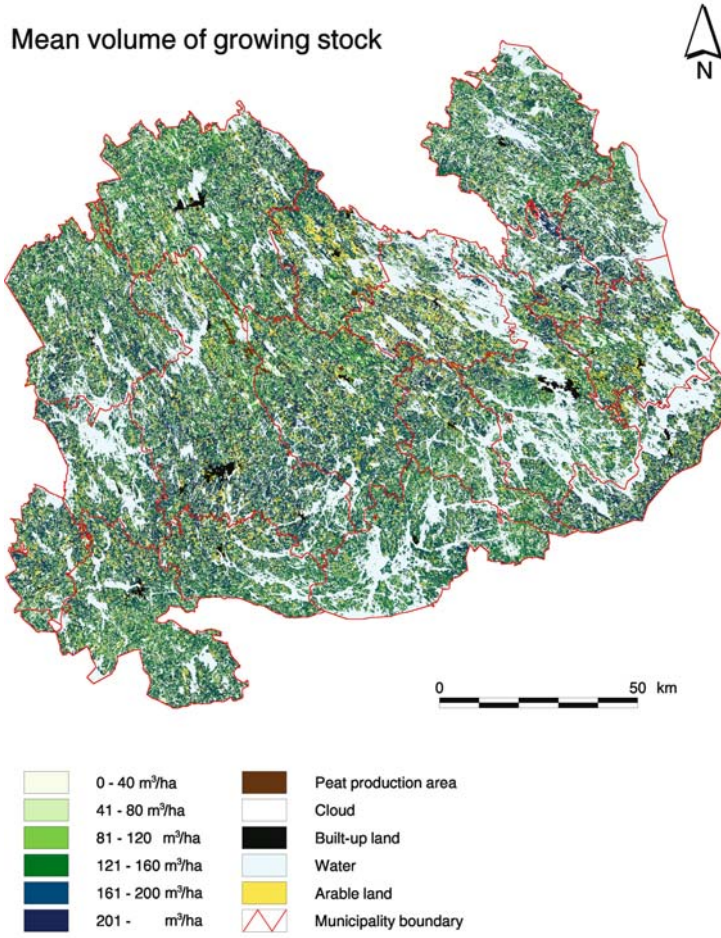
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**Fig. 9** The mean volume of growing stock on forest and poorly productive forest land in Pirkanmaa forestry centre.



# ETELÄ-SAVO

## Mean volume of growing stock

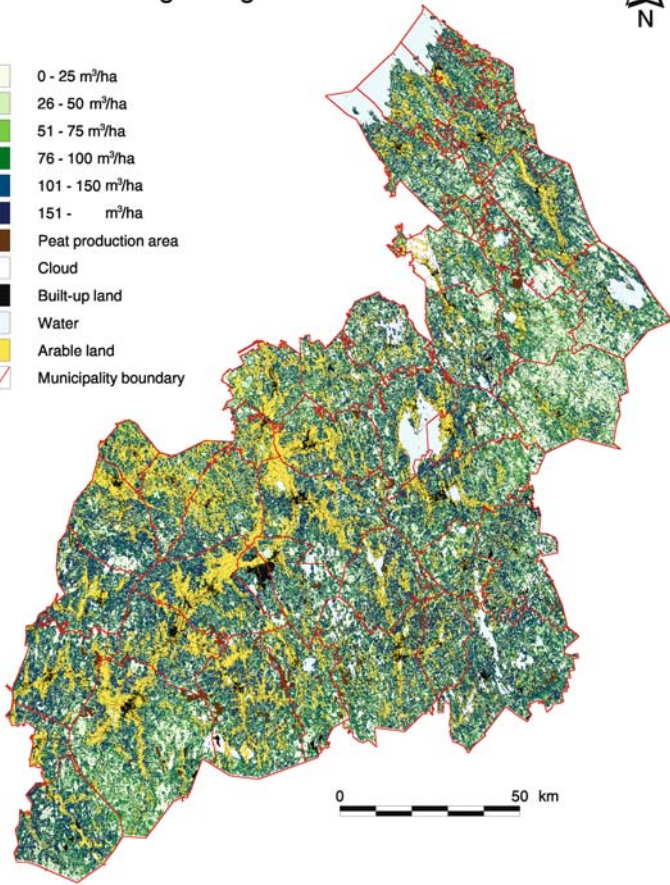


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**Fig. 10** The mean volume of growing stock on forest and poorly productive forest land in Etelä-Savo forestry centre.

# ETELÄ-POHJANMAA

## Mean volume of growing stock

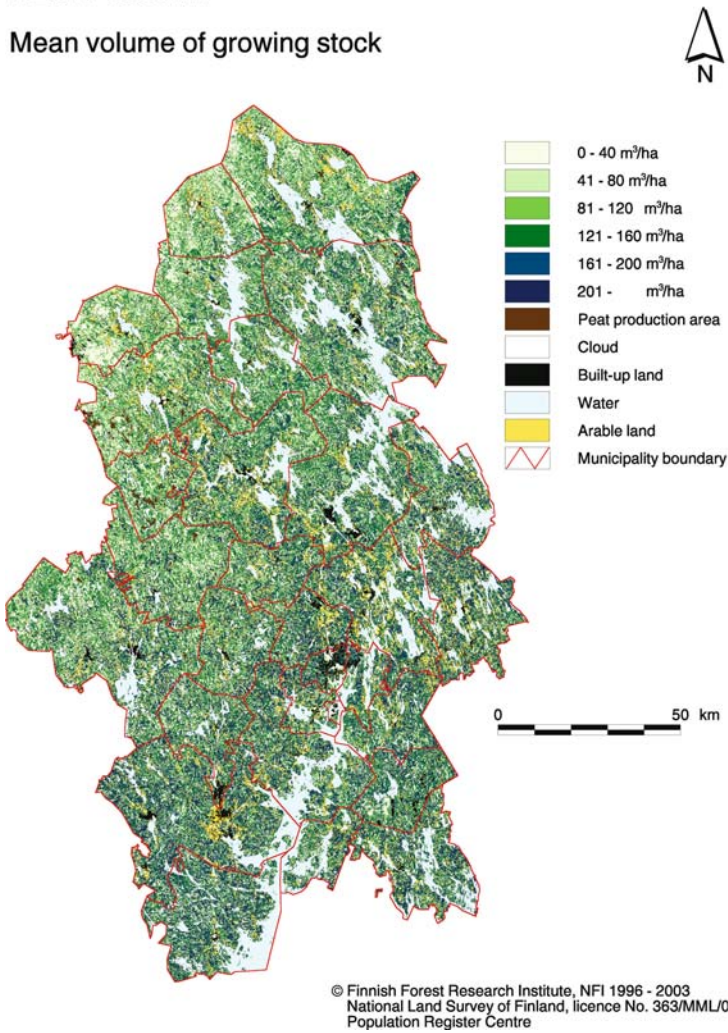


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**Fig. 11** The mean volume of growing stock on forest and poorly productive forest land in Etelä-Pohjanmaa forestry centre.

# KESKI-SUOMI

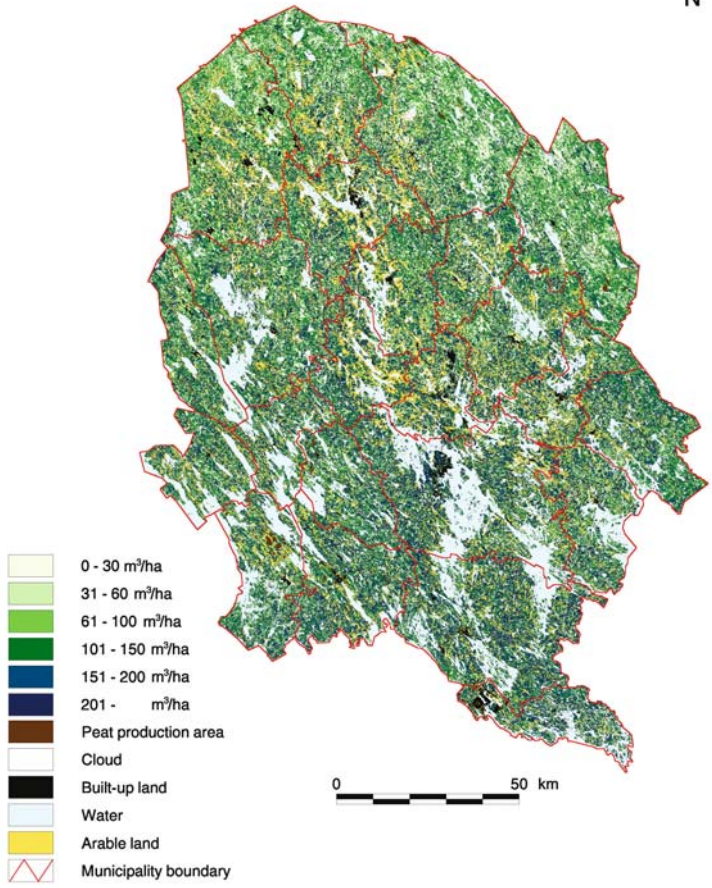
## Mean volume of growing stock



**Fig. 12** The mean volume of growing stock on forest and poorly productive forest land in Keski-Suomi forestry centre.

# POHJOIS-SAVO

## Mean volume of growing stock

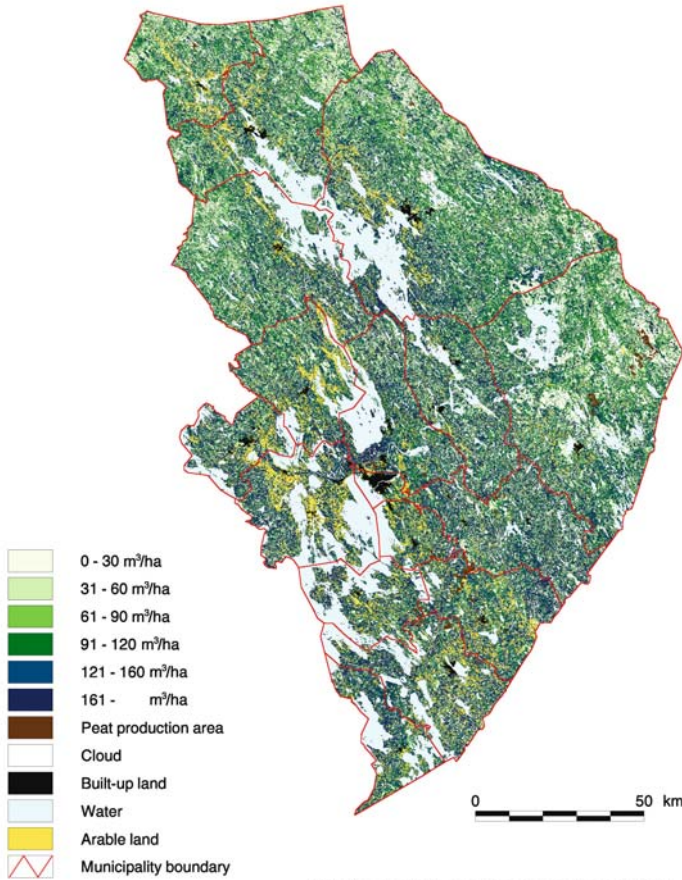


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**Fig. 13** The mean volume of growing stock on forest and poorly productive forest land in Pohjois-Savo forestry centre.

## POHJOIS-KARJALA

## Mean volume of growing stock

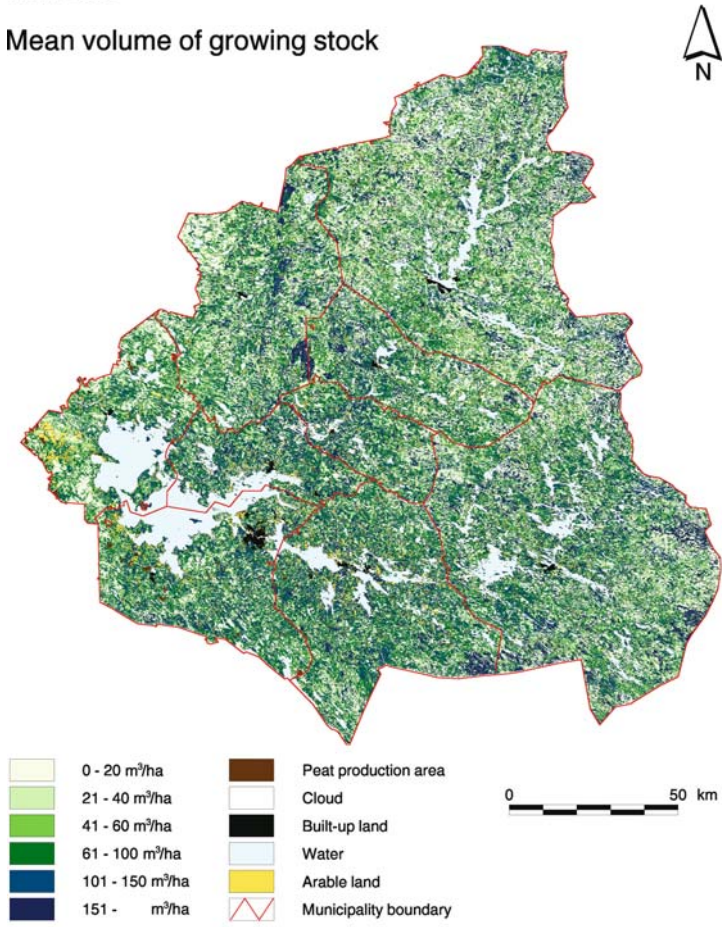


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**Fig. 14** The mean volume of growing stock on forest and poorly productive forest land in Pohjois-Karjala forestry centre.

# KAINUU

## Mean volume of growing stock

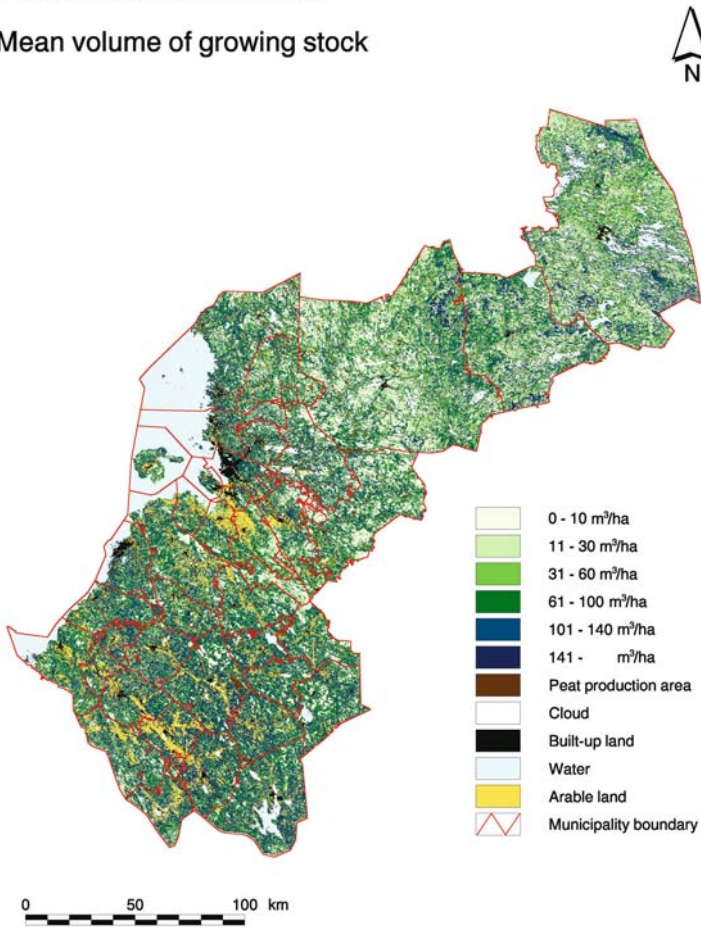


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**Fig. 15** The mean volume of growing stock on forest and poorly productive forest land in Kainuu forestry centre.

# POHJOIS-POHJANMAA

## Mean volume of growing stock

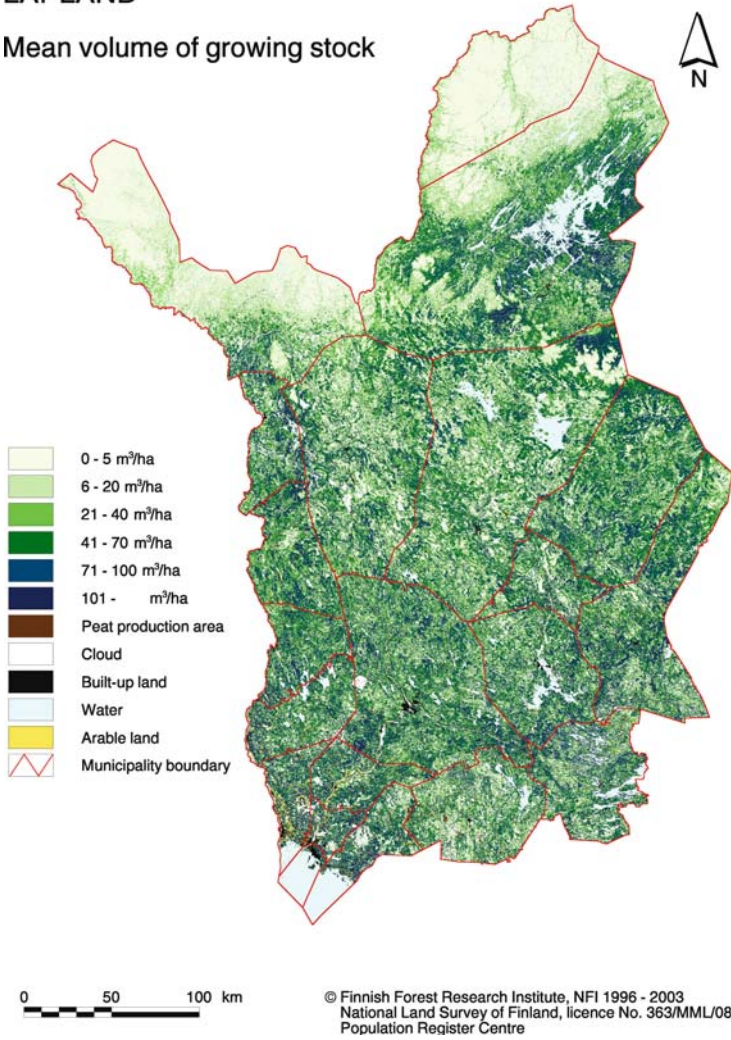


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**Fig. 16** The mean volume of growing stock on forest and poorly productive forest land in Pohjois-Pohjanmaa forestry centre.

# LAPLAND

## Mean volume of growing stock



**Fig. 17** The mean volume of growing stock on forest and poorly productive forest land in Lapland forestry centre.



# References

- Baffetta (2008) A first investigation on the design-based properties of k-NN technique in forest surveys. A Doctoral Thesis. Università degli Studi Firenze, Dipartimento di Statistica "G. Parenti", 96 p.
- Card DH (1982) Using known map category marginal frequencies to improve estimates of thematic map accuracy. *Photogramm Eng Remote Sens* 48:431–439.
- Cochran WG (1977) *Sampling techniques*. Wiley, New York, 428 p.
- Colby JD (1991) Topographic normalization in rugged terrain. *Photogramm Eng Remote Sens* 57:531–537.
- Czaplewski RL, Catts GP (1992) Calibration of remotely sensed proportion or area estimates for misclassification error. *Remote Sens Environ* 39:29–43.
- Diemer C, Lucaschewski I, Spelsberg G, Tomppo E, Pekkarinen A (2000) Integration of terrestrial forest sample plot data, map information and satellite data, an operational multisource-inventory concept. In: Ranchin T, Wald L (eds) *Proceedings of the Third Conference "Fusion of Earth Data: Merging Point Measurements, Raster Maps and Remotely Sensed Images"*. Sophia Antipolis, France, January 26–28, 2000, SEE/URISCA, Nice pp. 143–150
- Digital Elevation Model (2007) National Land Survey of Finland. <http://www.maanmittauslaitos.fi/en/default.asp?id=494>. Accessed 26 Mar 2007
- Ekström M, Sjöstedt-de Luna S (2004) Subsampling Methods to Estimate the Variance of Sample Means Based on Nonstationary Spatial Data with varying expected values. *Journal of American Statistical Association* March 2004, Vol. 99, No. 465, Theory and Methods
- FAO (2001) *Global Forest Resource Assessment 2000*. FAO Forestry Paper 140 Rome, 479 p.
- Finley AO, McRoberts RE (2008) Efficient k-nearest neighbor searches for multi-source forest attribute mapping. *Remote Sens Environ* 112:2203–2211
- Finley AO, McRoberts RE, Ek AR (2006) Applying an efficient k nearest neighbor search to forest attribute imputation. *For Sci* 52:130–135
- Finnish Statistical Yearbook of Forestry (2005) Finnish Forest Research Institute, Helsinki, 424 p.
- Franco-Lopez H, Ek AR, Bauer ME (2001) Estimation and mapping of forest stand density, volume, and cover type using the k-nearest neighbors method. *Remote Sens Environ* 77:251–274
- Gjertsen A (2005) Accuracy of forest mapping based on Landsat TM data and a kNN method. In: H. Olsson (ed) *Proceedings of ForestSat 2005*. Borås, Sweden, 31 May – 3 June 2005, pp. 7–11. <http://www.skogsstyrelsen.se>.
- Hagner O, Olsson H (2004) Normalisation of within-scene optical depth levels in multispectral satellite imagery using National Forest Inventory Plot Data. In: *Proceedings from the 24th EARSeL Symposium, Workshop on "Remote sensing of land use and land cover"*, Dubrovnik, Croatia, May 28–29, 2004
- Halme M, Tomppo E (2001) Improving the accuracy of multisource forest inventory estimates by reducing plot location error - a multicriteria approach. *Remote Sens Environ* 78:321–327

- Heikkinen J (2006) Assessment of uncertainty in spatially systematic sampling. In: Kangas A, Maltamo M (eds) *Forest Inventory - Methodology and Applications, Managing Forest Ecosystems Vol. 10*. Springer, Dordrecht, The Netherlands, pp. 155–176
- Henttonen H (1991) VMI8:n Pohjois-Suomen otanta-asetelmien vertailu satelliittikuvatulokinnan avulla. Comparing of sampling designs through simulation. Finnish Forest Research Institute, 10 p. (In Finnish)
- Hyvän metsänhoidon suositukset (2006) Forestry Development Centre Tapio, Helsinki (In Finnish)
- Ilvessalo Y (1927) The forests of Suomi Finland. Results of the general survey of the forests of the country carried out during the years 1921–1924. *Communications ex Instituto Quaestionum Forestalium Finlandie 11* (In Finnish with English summary), 421 p., tables 192 p.
- ISRO (2007) Indian Space Research Organisation (ISRO). <http://www.isro.org/>. Accessed 15 June 2007
- Katila M (2004) Controlling the estimation errors in the Finnish multisource National Forest Inventory. Ph.D. Thesis, Faculty of Agriculture and Forestry, University of Helsinki. Finnish Forest Research Institute Res Pap 910. <http://ethesis.helsinki.fi/julkaisut/maa/mvaro/vk/katila/>. Accessed 10 March 2008
- Katila M (2006a) Correcting map errors in forest inventory estimates for small areas. In: Kangas A, Maltamo M (eds) *Forest Inventory - Methodology and Applications, Managing Forest Ecosystems Vol. 10*. Springer, Dordrecht, The Netherlands, pp. 225–233
- Katila M (2006b) Empirical errors of small area estimates from the multisource National Forest Inventory in Eastern Finland. *Silva Fenn* 40:729–742
- Katila M, Tomppo E (2001) Selecting estimation parameters for the Finnish multi-source national forest inventory. *Remote Sens. Environ* 76:16–32
- Katila M, Tomppo E (2002) Stratification by ancillary data in multisource forest inventories employing k-nearest neighbour estimation. *Can J For Res* 32(9): 1548–1561
- Katila M, Heikkinen J, Tomppo E (2000) Calibration of small-area estimates for map errors in multisource forest inventory. *Can J For Res* 30:1329–1339
- Kim H-J, Tomppo E (2006) Model-based prediction error uncertainty estimation for k-nn method. *Remote Sens Environ* 104:257–263
- Koukal T, Suppan F, Schneider W (2005) The impact of radiometric calibration on kNN predictions of forest attributes. In: Olsson H (ed) *Proceedings of ForestSat 2005*. Borås, Sweden, 31 May – 3 June 2005, pp. 17–21. <http://www.skogsstyrelsen.se>.
- Kuusela K, Poso S (1970) Satellite pictures in the estimation of the growing stock over extensive areas. *Photogramm J Finland* 4:3–9
- Kuusela K, Salminen S (1969) The 5th National Forest Inventory in Finland, General design, instructions for field work and data processing. *Communications Instituti Forestalis Fenniae* 69:1–72
- Laasasenaho J (1982) Taper curve and volume functions for pine, spruce and birch. *Communications Instituti Forestalis Fenniae* 108:1–74
- Laitila J, Asikainen A, Anttila P (2008) Energiapuuvarat. Energy Wood Resources. In: Kuusinen M, Ilvesniemi H (eds) *Energiapuun korjuun ympäristövaikutukset, Tapion ja Metlan julkaisuja*. pp. 6–12. <http://www.metsavastaa.net/energiapuu/raportti>. (In Finnish)
- Lappi J (2001) Forest inventory of small areas combining the calibration estimator and a spatial model. *Can J For Res* 31:1551–1560.
- Lehto J, Leikola M (1987) Käytännön metsätyypit. Kirjayhtymä, Helsinki (In Finnish), 96 p.
- Linton O, Härdle W (1998) Nonparametric regression. In: Kotz S, Read CB, Banks DL (eds) *Encyclopedia of Statistical Sciences, update Vol. 2*. Wiley, New York, pp. 470–485
- Maanmittauslaitoksen maastotietokohteet (Feature catalog of the topographic database) (2005) National Land Survey of Finland, Helsinki, Maanmittauslaitoksen julkaisuja 97. <http://www.maanmittauslaitos.fi/default.asp?id=887>. (In Finnish)
- Maastotietojen keruuhje (Manual of field work) (1996) Sisäinen ohje, Manuscript, National Land Survey of Finland (In Finnish)
- Magnussen S, McRoberts RE, Tomppo E (2007) A model-based estimator of the mean square error of k-nearest neighbour predictions with remotely-sensed ancillary variables. *Remote Sens Environ* (In press)

- Manual of Remote Sensing (1983) American Society of Photogrammetry. Falls Church, Virginia
- Marklund LG (1988) Biomass functions for pine, spruce and birch in Sweden. Sveriges Lantbruksuniversitet, Uppsala, Sweden, Inst. Skogstaxering. Rapp. 45
- Maselli F, Chirici G, Bottai L, Corona P, Marchetti M (2005) Estimation of Mediterranean forest attributes by the application of k-NN procedures to multitemporal Landsat ETM+ images. *International. J Remote Sens* 26:3781–3796
- Matérn B (1947) Methods of estimating the accuracy of line and sample plot surveys. *Meddelanden från Statens Skogsforskningsinstitut* 36.1. (In Swedish with English summary), 138 p.
- Matérn B (1960) Spatial variation. *Medd. fr. St. Skogsf. Inst.* 49(5). Also appeared as number 36 of *Lecture Notes in Statistics*. Springer, New York, 151 p.
- McRoberts RE (2006) A model-based approach to estimating forest area. *Remote Sens Environ* 103:56–66
- McRoberts RE, Tomppo EO (2007) Remote sensing support for national forest inventories. *Remote Sens Environ* 110:412–419
- McRoberts RE, Nelson MD, Wendt DG (2002a) Stratified estimation of forest area using satellite imagery, inventory data, and the k-Nearest Neighbors technique. *Remote Sens Environ* 82:457–468
- McRoberts RE, Wendt DG, Nelson MD, Hansen MH (2002b) Using a land cover classification based on satellite imagery to improve the precision of forest inventory area estimates. *Remote Sens Environ* 81:36–44
- McRoberts RE, Holden GR, Nelson MD, Liknes GC, Gormanson DD (2006) Using satellite imagery as ancillary data for increasing the precision of estimates for the Forest Inventory and Analysis program of the USDA Forest Service. *Can J For Res* 36:2968–2980
- McRoberts RE, Tomppo EO, Finley AO, Heikkinen J (2007) Estimating areal means and variances of forest attributes using the k-Nearest Neighbors technique and satellite imagery. *Remote Sens Environ* 111:466–480
- Metinfo (2007) Metinfo -forest information services, Finnish Forest Research Institute. <http://www.metla.fi/metinfo/index-en.htm>. Accessed at 9 Mar 2007
- Mikkola A (1997) SLICES - Selvityshanke alueiden käyttöä ja peitteisyyttä kuvaavien valtakunnallisten luokitusaineistojen muodostamiseksi, Loppuraportti. Maanmittauslaitos (In Finnish)
- Mitchell M (1996) *An Introduction to Genetic Algorithms*. MIT, USA, 226 p.
- Nilsson M (1997) *Estimation of Forest Variables Using Satellite Image Data and Airborne Lidar*. Ph.D. Thesis, Swedish University of Agricultural Sciences, The Department of Forest Resource Management and Geomatics, Acta Universitatis Agriculturae Sueciae. *Silvestria* 17, 84 p.
- Peterson U (1989) Seasonal Reflectance Profiles for Forest Clearcut Communities at Early Stages of Secondary Succession. *Eesti Teaduste Akadeemia, Preprint A-5*
- Poso S (1972) A method of combining photo and field samples in forest inventory. *Communications Institutii Forestalis Fenniae* 76(1), 133 p.
- Rao J N K (2003) *Small Area Estimation*. Wiley, New York, 313 p.
- Reese H, Nilsson M, Sandström P, Olsson H (2002) Applications using estimates of forest parameters derived from satellite and forest inventory data. *Comput Electron Agric* 37:37–56
- Reese H, Nilsson M, Granqvist Pahlén T, Hagner O, Joyce S, Tingelöf U, Egberth M, Olsson H (2003) Countrywide estimates of forest variables using satellite data and field data from the National Forest Inventory. *Ambio* 32:542–548
- Suomen pinta-ala kunnittain (The area of Finland by municipalities) 1.1.2003 (2003) National Land Survey of Finland, Helsinki. <http://www.maanmittauslaitos.fi/default.asp?id=894>. (In Finnish)
- The Finnish Coordinate Reference Systems (2007) In: Ollikainen M, Ollikainen M (eds) *Finnish Geodetic Institute and National Land Survey of Finland*. <http://www.maanmittauslaitos.fi/en/default.asp?id=235>. Accessed 1 Jun 2007
- Tokola T, Pitkänen J, Partinen S, Muinonen E (1996) Point accuracy of a non-parametric method in estimation of forest characteristics with different satellite materials. *Int J Remote Sens* 17:2333–2351
- Tomppo E (1988) Standwise forest variate estimation by means of satellite images. In: IUFRO S4.02.05 Meeting, August 28 - September 2, 1988, Forest Station Hyytiälä, Finland, Proceedings.

- University of Helsinki, Department of Forest Mensuration and Management, Res Notes 21:103–111
- Tomppo E (1990) Satellite image-based National Forest Inventory of Finland. *Photogramm J Finland* 12:115–120
- Tomppo E (1991) Satellite image-based National Forest Inventory of Finland. In: Proceedings of the symposium on Global and Environmental Monitoring, Techniques and Impacts, September 17–21, 1990 Victoria, British Columbia Canada. *Int Archives Photogrammetry Remote Sens* 28:419–424
- Tomppo E (1992) Satellite image aided forest site fertility estimation for forest income taxation. *Acta For Fenn* 229:70.
- Tomppo E (1996) Multi-source National Forest Inventory of Finland. In: Päivinen R, Vanclay J, Miina S (eds) *New Thrusts in Forest Inventory, Proceedings of the Subject Group S4.02-00 'Forest Resource Inventory and Monitoring' and Subject Group S4.12-00 'Remote Sensing Technology'*, Vol. 1. IUFRO XX World Congress, 6–12 Aug. 1995, Tampere, Finland. European Forest Institute, Joensuu, Finland pp. 27–41
- Tomppo E (2006a) The Finnish National Forest Inventory. In: Kangas A, Maltamo M (eds) *Forest Inventory. Methodology and Applications, Managing Forest Ecosystems Vol. 10*. Springer, Dordrecht, The Netherlands pp. 179–194
- Tomppo E (2006b) The Finnish multi-source national forest inventory - small area estimation and map production. In: Kangas A, Maltamo M (eds) *Forest Inventory. Methodology and Applications, Managing Forest Ecosystems Vol. 10*. Springer, Dordrecht, The Netherlands pp. 195–224
- Tomppo E, Halme M (2004) Using coarse scale forest variables as ancillary information and weighting of variables in k-nn estimation: a genetic algorithm approach. *Remote Sens Environ* 92:1–20
- Tomppo E, Henttonen H (1996) Suomen metsävarat 1989–1994 ja niiden muutokset vuodesta 1951 lähtien. *Metsätilastotiedote* 354. Metsäntutkimuslaitos (In Finnish)
- Tomppo E, Varjo J, Korhonen K, Ahola A, Ihalainen A, Heikkinen J, Hirvelä H, Mikkela H, Mikkola E, Salminen S, Tuomainen T (1997) Country report for Finland. In: Study on European Forestry Information and Communication Systems, Reports on Forestry Inventory and Survey Systems Vol. 1. European Commission pp. 145–226
- Tomppo E, Henttonen H, Korhonen, KT, Aarnio A, Ahola A, Heikkinen J, Ihalainen A, Mikkela H, Tonteri T, Tuomainen T (1998a) Etelä-Pohjanmaan metsäkeskuksen alueen metsävarat ja niiden kehitys 1968–97. In: *Etelä-Pohjanmaa. Metsävarat 1968–97, hakkuumahdollisuudet 1997–2026. Metsätieteen aikakauskirja - Folia For* 2B/1998:293–374 (In Finnish)
- Tomppo E, Katila M, Moilanen J, Mäkelä H, Peräsaari J (1998b) Kunnittaiset metsävaratiedot 1990–94. *Folia For* 4B/1998:619–839 (In Finnish)
- Tomppo E, Goulding C, Katila M (1999) Adapting Finnish multi-source forest inventory techniques to the New Zealand preharvest inventory. *Scand J For Res* 14:182–192
- Tomppo E, Korhonen KT, Heikkinen J, Yli-Kojola H (2001a) Multisource inventory of the forests of the Hebei Forestry Bureau, Heilongjiang, China. *Silva Fenn* 35(3):309–328
- Tomppo E, Henttonen H, Tuomainen T (2001b) Valtakunnan metsien 8. inventoinnin menetelmä ja tulokset metsäkeskuksittain Pohjois-Suomessa 1992–94 sekä tulokset Etelä-Suomessa 1986–92 ja koko maassa 1986–94. *Folia For* 1B/2001:99–248 (In Finnish)
- Tomppo E, Heikkinen J, Ihalainen A, Mäkelä H, Tonteri T, Tuomainen T (2007) The 9th Forest Inventory of Finland - Methods and Results. Manuscript, Finnish Forest Research Institute
- Tomppo E, Olsson H, Ståhl G, Nilsson M, Hagner O, Katila M (2008) Combining National Forest Inventory Field Plots and Remote Sensing Data for Forest Databases. *Remote Sens Environ* 10.1016/j.rse.2007.03.032
- USGS (2007) <http://landsat.usgs.gov/index.php>.
- Walsh TA, Burk TE (1993) Calibration of satellite classifications of land area. *Remote Sens Environ* 46:281–290
- Veltheim T (1987) Pituusmallit männylle, kuuselle ja koivulle. *Metsänarvioimistieteen pro gradu -tutkielma*, MSc. Thesis University of Helsinki (In Finnish)

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