NFI Forest resources – Data Quality Descriptions

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1. Relevance of statistics

1.1 Content and purpose of use

Forest resource data contain data on the surface areas of forest land, growing stock volume, biomass, growth, forest health, biodiversity, and felling potential based on NFI data. The results of the National Forest Inventories (NFI) are used for the purposes of forest and environmental policies both in Finland and internationally. Furthermore, the results are used in forestry management and as basic data for investment decisions in the forest industry, the calculation of greenhouse gas emissions, and for research purposes.

1.2 Definitions and classifications

1.2.1 Forestry land classifications

The total land surface area is divided into forestry land and land used for other purposes. Forestry land refers to the land areas that are not used for some other purpose. Forestry land includes land that is available for wood production and that is left outside of wood production. Felling is not allowed in areas that are left outside of wood production. Areas excluded from wood production include, for example, nature reserves conserved by law, lands conserved based on a land-owner decision, areas in conservation programmes, and planning zones in which felling is prohibited.

Forestry land is classified according to the timber production capacity, as follows:

Forest land: the potential mean annual increment totals at least 1.0 m^3/ha.

Poorly productive forest land: the potential mean annual increment equals less than 1.0 but over 0.1 m^3/ha.

Unproductive land: the potential mean annual increment equals less than 0.1 m^3/ha.

Other forestry land: includes forest lorry routes, permanent storage, plots used for the purposes of the forest industry, gravel pits, and wildlife fields, etc. that are part of the forest.

Based on the soil type, the forest lands, poorly productive forest lands, and unproductive lands can be further classified into mineral soil and peatland. Peatland areas either have an organic layer of peat that covers the mineral soil or their ground cover consists of over 75 per cent of helophytes.

1.2.2 Classification by forest owners

The classification used for forest owners in the National Forest Inventory:

Private owners: Non-industrial, private forest owners, heirs, private firms, etc.

Companies: Limited companies (excluding housing companies) and their pension trusts.

Government: The State Forest Enterprise and other government authorities and agencies.

Others: Municipalities, parishes, and entities. Communities include co-operatives, jointly owned forests, limited partnerships, housing companies and foundations.

1.2.3 Categories of drained peatland

Drained peatlands are categorised based on the effects of draining into either recently drained peatlands, transitional peatlands or drained peatland forests.

A recently drained peatland: a peatland where the draining has not yet had effects on the undergrowth and growing stock increment. Areas in which ditches have been clogged and, consequently, where the peatland has resumed its pre-draining state are also referred to as recently drained peatland.

Transitional peatland: an area where growing stock increment has been visibly recovered, but undergrowth is still characterised by the original peatland type.

Drained peatland forests: helophytes have been replaced by dominant forest vegetation, and the peatland water economy does not obstruct the closing of the growing stock.

1.2.4 Developmental stages of forests

The developmental states of forests reflect the silvicultural and wood production stages of the growing stock. Developmental stages are defined for forest land only.

Temporarily unstocked regeneration area: a space or area that is devoid of trees as a result of regeneration felling. Trees that need to be cleared and/or single reserve trees or reserve tree groups may remain.

Young seedling stand: the mean height of seedlings does not exceed 1.3 metres.

Advanced seedling stand: the average height exceeds 1.3 metres, but the diameter at breast height usually remains under 8 cm, not exceeding 10 cm even in the largest trees.

Young thinning stand: in thinning stage, mainly pulpwood derived from thinning.

Advanced thinning stand: forest consists mainly of log-sized roundwood.

Mature stand: regeneration felling is the next stage of removal.

Shelter tree stand: regeneration felling has been carried out, and 150–300 trees per hectare remain for seedling.

Seed tree stand: regeneration felling has been carried out, and 30–150 trees per hectare remain for seeding.

1.2.5 Silvicultural quality of forests

Silvicultural quality categories:

Good: Right tree species for the habitat, forest management complies with good silvicultural standards. Growing stocks in the crown layer are densely and evenly grown.

Satisfactory: The forest is able to take some advantage of the growth conditions provided by the soil.

Passable: The forest is sparse and there are features that significantly decrease the quality of the growing stock, such as damage, growing stock that is of technically poor quality or a large number of growing stock is of little value. If felling or other silvicultural measures have been clearly delayed, the quality of the forest can be diminished to the category of tolerable. *Low-yielding:* The production volume of the forest remains clearly below (as a general guideline, at least by 40 per cent) the potential of the area. Reasons may include unsuitable tree species for the habitat, damage, low-yielding growing stock, over-maturity, technical quality of the growing stock, etc. Low-yielding forests are either in need of immediate regeneration or the increment may continue to secure the growth of the potential in the near future, but not until the end of the rotation period. A clearcut area is classified as low-yielding if over 4 years has passed since the regeneration felling and the area has not been cultivated.

1.3 Research subject and informants

The National Forest Inventory targets forests and other land areas throughout the country. Forest land and poorly productive forest land are usually the focus when growing stock volume and increments are measured. The measurements and classifications are carried out in the sample plots selected by systematic sampling. In addition to the field surveys, data concerning the sample plots is acquired from the real estate register of the National Land Survey of Finland,

from the available conservation area, and planning zone maps and, in the case of the Finnish State Forest Enterprise, from the Enterprise forest data system. Data is used for the purposes of establishing owner groups and wood production restrictions. Land surfaces are obtained from the municipal land surface statistics of the National Land Survey of Finland.

1.4 Taking into account the perspective of the users

The NFI's data content and provision of result services are being constantly improvement based on feedback on data submitted by users and other communications received from NFI researchers and anyone involved in the forestry field.

2. Accuracy and reliability of data

2.1 Research method

The forest resource data are based on the National Forest Inventories that have been conducted in Finland since the 1920s. Forest resource data contain data on the surface areas, growing stock volume, biomass, growth, forest health, and biodiversity. The NFI data are measured on the sample plots throughout Finland. Some of the plots are permanent sample plots that will also feature in the next inventory, whereas others are single-time sample plots that are included only in one inventory. There are more sample plots in Southern Finland than in Northern Finland.

2.2 Factors affecting reliability

The National Forest Inventory is based on statistical samples derived from field measurements. For example, in the NFI 11, the data contained approximately 70 000 sample plots in the entire land area and 58 000 sample plots on forestry land. A total of 473 000 living trees were measured in the sample plots on forest land and poorly productive forest land. The sampling error estimate is calculated using an estimator created for the calculation of the mean error in a systematic sample. For example, the relative mean error of growing stock in the entire country equals approximately 0.5%. The ability to achieve sufficiently reliable results on the regional level is an important factor in the planning of the density of the sample plot network.

2.3 Error modification procedure

Any possible errors detected in the statistic data will be corrected instantly. The corrected data will be posted on the homepage of the Statistics Services.

3. Timeliness and promptness of published data

The next publication of new results will take place in August 2017. The measurements carried out during a single year are not sufficient for the calculation of reliable results for all the key figures, so the calculation combines measurement data from several years. The time period reflected in the results depends on the measurement period of the data used in the calculation at the given time. The NFI 11 measurements were carried out in 2009–2013, and they can be seen

to reflect the year 2011; the growing stock results reflect approximately the year 2008, because it is based on the growth measurements of the five previous full growing seasons.

4. Coherence and comparability of data

The results of the National Forest Inventory (NFI) provide an extensive time series for the status of Finnish forests, going back to the 1920s. Additional benefits of making nationwide forest inventories include broad data content, objectivity, and it is free of statistical biases. NFI produces reliable forest resources data that covers the entire country and all owner groups. However, one must take into account the changes that have taken place in the surface area of the country (post-war territory losses), changes in the area classification, and changes in the forest resource data that is collected and its classifications.

5. Availability and accessibility of data

The statistics are published in the Natural Resources Institute Finland's Statistical Services database, at the address: stat.luke.fi under forest resources - NFI.

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