

## Supplementary file S3: Explanatory notes on some variables used in this publication

The purpose of this document is to give description of those key variables that are reported in the main publication. This document does not include all the NFI variables or measurements.

### Restrictions on wood production

Information on protection status has been derived for the NFI plots according to the plot location data. The data source used was the register of protected areas maintained by the Finnish Environment Institute and the national spatial database of regional plans. Metsähallitus has provided forest management category to the sample plots on government-owned lands. In addition to these, possible other restrictions on forest use have been observed in the field, such as a restriction caused by a specific habitat type in accordance with the Forest Act, occurrence of an endangered species or the immediate vicinity of a settlement. Based on the above information, forests are divided into forest available for wood production, forest available for restricted wood production and forest not available for wood supply. The term forest available for wood **supply** is used for the combination of the two first-mentioned categories.

### Site fertility classes

Site types have been described in inventories from NFI5 onwards in a comparative way using the main site type and site fertility classes. In the latest inventories, there are several additional variables related to site description but these two mentioned variables have remained unchanged since the NFI5. The main site type distinguishes mineral soils and peatlands, and within peatlands further spruce mires, pine mires and open mires. The main site type is peatland if the organic layer covering the mineral soil is peat or more than 75% of the undergrowth vegetation consists of species typical on peatlands. Drained, previously open mires, now forested, are classified as spruce or pine mires based on vegetation.

Site fertility types are (Hotanen et al. 2013, Laine et al. 2012):

- 1 Herb rich forests, eutrophic mires and corresponding drained mires (recently drained, drained transforming, drained peatland forests)
- 2 Herb rich heath forests, mesotrophic mires and corresponding drained mires.
- 3 Mesic heath forests and meso-oligotrophic natural and drained mires.
- 4 Sub-xeric heath forests and oligotrophic natural and drained mires.
- 5 Xeric heath forests and oligo-ombrotrophic natural and drained mires.
- 6 Barren heath forests and Sphagnum fuscum dominated (ombrotrophic) natural and drained mires.
- 7 Rocky and sandy soils and alluvial lands.
- 8 Summit and coniferous fell forests.
- 9 Boreal birch fell forests
- 10 Treeless fells

## Drainage status

Drained peatlands are classified in three development stages according to the draining effect (Sarasto 1961). The most advanced drainage is observed on transformed mires (peatland forest stage) where the vegetation resembles the vegetation of mineral soils and where the level of ground water is not limiting the growth of trees. The second drainage class is the transforming mires where the drainage has improved the growth of trees but the canopy is not yet closed, and original vegetation of the undrained peatland is still visible. The first drainage class is non-changed drained mires where the drainage has not (yet) changed the growth of the trees nor the vegetation composition.

## Dominant tree species

In the NFI, the dominant tree species in the forest stand is determined for each tree story according to the stem number (seedling stands) or the basal area (other development classes) of the tree species. When determining the dominant tree species, the proportions of coniferous and broadleaf tree species are first assessed. In a tree story dominated by conifers, the dominant tree species is the coniferous species that accounts for the largest share of the seedlings or basal area. In a tree story dominated by broadleaf species, the dominant tree species is a broadleaf tree species that accounts for the largest share of the seedlings or basal area. The dominant tree species of a forest stand is the dominant tree species in the dominant tree story class.

## Forest quality

The quality of the forest stand describes the silvicultural status of the forest. It is subjectively assessed based on density and quality of the growing stock and quality and timing of accomplished silvicultural measures. The quality classes are good, satisfactory, passable and under-productive. The under-productive class indicates that the density or quality of growing trees is so poor that immediate regeneration is economically more feasible than growing till the normal rotation age. For each quality class there are qualitative criteria and some quantitative thresholds for density of growing stock and number of crop seedlings as well as list of species that are suitable for each site type. On regeneration sites (in recently clear cut stands and seed tree stands) the quality and timeliness of regeneration activities are used as the criteria for assessing the quality. In seedling stands, mainly the suitability of the tree species for the site class, number of crop seedlings and spatial distribution of seedlings are considered for the stand quality classification. If the stand quality is not classified as good, the most significant reason for the reduction in quality is recorded - if necessary, also the second most significant reason.

## Accomplished cuttings and other measures

The recorded accomplished measures in NFI12 include cuttings (including early and later pre-commercial thinning), cultivation (planting or direct seeding), soil preparation, drainage and other silvicultural operations (e.g. pruning, clearing for harvesting, harvesting of cutting residues or stumps,

and restoration). For each above listed group of accomplished measures only the latest one is recorded. The time of the accomplished measure is recorded, also.

## Proposed future forest management measures

For each NFI plot stand the future management measures are proposed in the field following the principles of forest management guidelines (Äijälä ym. 2014). Only stand level data are considered in these proposals. Neither the preferences of the forest owner nor the national or regional sustained yield are considered in these proposals. The thinning proposal usually requires that the basal area of the stand at the time of the proposed cutting is at least 6 m<sup>2</sup>/ha larger than guideline value presented in the NFI field manual. Prerequisite for proposing regeneration cutting is usually that the age of the stand at the time of the proposed cutting exceeds the regeneration maturity limit specified in the NFI field manual.

The timing of the management measure is proposed using classification: 1<sup>st</sup> five year period, delayed; 1<sup>st</sup> five year period, not delayed; 2<sup>nd</sup> five year period.

## Dead wood

Measurements of dead wood as an indicator of biodiversity was introduced in NFI at the beginning of NFI9 (1996). Since NFI10 the dead wood measurements have been limited to permanent plots. Dead wood is measured on productive and poorly productive forest using a circular plot with 7 m radius. Both standing and fallen dead trees larger than 10 cm in diameter and length more than 1.3 meters are included in the measurements.

Estimated variables for both standing and fallen dead trees are the following: dead tree type, stem number, tree species, outward appearance, bark coverage and degree of decay. The degree of decay grading is similar for both standing and fallen dead trees, although the most decayed class is not applicable for the standing dead trees. Outward appearance of the tree, bark coverage and degree of decay are estimated from at least 100 mm thick part of the stem.

## References

- Äijälä O, Koistinen A, Sved J, Vanhatalo K, Väisänen, P. (eds.) 2014. Metsänhoidon suositukset [Forest Management Guidelines]. Metsätalouden kehittämiskeskus Tapion julkaisuja.
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