Appendix 2

Estimation of the stand density index (SDI) for each NFI plot

The estimation of stand density is based on the stand density index of Reineke (Reineke, 1933; Zeide, 2005):

$$SDI = N * \left(\frac{25}{dg}\right)^{-1.605}$$

N: stem number per ha

dg: quadratic mean diameter (cm)

(1) The 95th percentile of the SDI distribution (SDI_95) of pure stands for each species was determined.

(2) Weighting factors were calculated by dividing the 95-percentile value of spruce (used as reference species) by the 95-percentile value of the respective tree species (Table A2):

$$weighting\ factor = \frac{SDI\_95_{spruce}}{SDI\_95_{species}}$$

Table A2. 95th percentile of SDI distribution and weighting factor for each species

species	95th percentile of SDI distribution (SDI_95)	Weighting factor
spruce	1674.457	1.000
pine	1483.888	1.128
fir	1330.258	1.259
larch	1314.548	1.274
Japanese larch	1260.751	1.328
Douglas fir	1536.864	1.090
beech	1188.593	1.409
oak	1171.272	1.430
alder	1514.525	1.106
birch	1030.464	1.625
ash	1413.660	1.184
poplar	1180.323	1.419
red oak	1207.188	1.387

(3) For each NFI plot SDI was calculated separately for each species:

$$SDI_{species} = N_{species} * \left(\frac{25}{dg_{species}} \right)^{-1.605}$$

(4) The species-specific SDI$_{species}$ was corrected by multiplying with the weighting factor:

$$SDI_{species\_corr} = weighting\ factor * SDI_{species}$$

(5) Species-specific SDI$_{species\_corr}$ for all species at a plot were summarized resulting in one SDI for each NFI plot:

$$SDI = \sum_{1}^{n_{species}} SDI_{species\_corr}$$

n$_{species}$: number of different species at the plot

References

Reineke LH, 1933. Perfecting a stand density index for even-aged forests. J Agric Res 46: 627–638.

Zeide B, 2005. How to measure stand density. Trees 19 (1): 1–14.