

List of indices

Stand density index [1]:

$$SDI = N \cdot \left(\frac{25}{dbh_g} \right)^{-1.605} \quad (1)$$

where dbh_g = quadratic mean diameter (cm), N = number of trees per hectare.

Crown closure [2]:

$$CC = 100 \cdot (1 - e^{-1.CPA}) \quad (2)$$

where CPA = crown projection area per hectare (ha).

Näslund function [3] for height-diameter relationship:

$$h = \frac{dbh^2}{(a+b.dbh)^2} + 1.3 \quad (3)$$

where h = tree height (m), dbh = tree diameter at breast height, (cm) a and b = parameters of the equation.

Pielou-Mountford index of non-randomness [4,5]:

$$\alpha = \frac{1}{n} \pi \left(\frac{N}{P} \right) \sum_{i=1}^n \omega'_i \quad (4)$$

where n = number of sample points, N = number of trees in a sample plot, P = sample plot area (m^2), ω'_i = quadratic distance from sample point to the nearest tree (m).

Clark-Evans index of aggregation [6]:

$$R = \frac{\frac{1}{N} \sum_{i=1}^N r_i}{0.5 \sqrt{\frac{P}{N}} + 0.0514 \cdot \frac{u}{N} + 0.041 \cdot \left(\frac{u}{N} \right)^{\frac{3}{2}}} \quad (5)$$

where r_i = distances between two nearest neighbors (m), N = number of trees in sample plot, P = plot area (m^2), u = perimeter of sample plot (m).

Diameter differentiation index [7]:

$$TM_d = \frac{1}{n} \cdot \sum_{i=1}^n (1 - rd_{ij}) \quad (6)$$

where rd = ratio between larger and smaller diameter of all nearest neighboring trees in a stand.

Height differentiation index [7]:

$$TM_h = \frac{1}{n} \cdot \sum_{i=1}^n (1 - rh_{ij}) \quad (7)$$

where rh = ratio between larger and smaller height of all nearest neighboring trees in a stand.

Arten-profile index [8]:

$$Ap = \frac{-\sum_{i=1}^m \sum_{j=1}^3 [p_{ij} \cdot \ln(p_{ij})]}{\ln(3 \cdot m)} \quad (8)$$

where m = number of tree species, p_{ij} = proportion of basal area of trees of i^{th} tree species in j^{th} stand layer.

Total diversity index [9]:

$$B = \left\{ 4[\log(m) \cdot (1.5 - Z_{max} - Z_{min})] + 3 \left(1 - \frac{h_{min}}{h_{max}} \right) + \left(1 - \frac{r_{min}}{r_{max}} \right) + [1 - \log(HCB_{min})] + \left(1 - \frac{CD_{min}}{CD_{max}} \right) \right\} \quad (9)$$

where m = number of tree species, Z_{max} = maximum tree species proportion, Z_{min} = minimum tree species proportion, h_{min} = minimum tree height in the stand (m), h_{max} = maximum tree height in the stand (m), r_{min} = minimum tree spacing (m), r_{max} = maximum tree spacing (m), HCB_{min} = minimum height to crown base (m), CD_{min} = minimum crown diameter (m), CD_{max} = maximum crown diameter (m).

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