Appendix 1: Vegetation sampling techniques

Land cover mosaic
The land cover mosaic was produced by digitizing 20ha subsets of Google™ Earth images encapsulating each site and their respective arrays of recorders. The resolution of all five images was approximately 3m. ArcGIS 10.2 (ESRI) was used as the primary system of image manipulation, where comparable land-cover types were digitized according to the subjective identification of the land-cover boundaries by the user. The landscape structure of the classified land-use types was processed using Fragstats© v4.0 and included the following metrics for describing the dimensions of patches across the landscape: total area, number of patches, patch density, total edge, area weighted average, perimeter/area ratio, and cohesion (Tab. 2 suppl).

Ground vegetation richness
The vegetation richness at the ground level was calculated using a line intercept method (Canfield 1941) along four transects of 20m each centred on the spot used to place the digital recorder. The frequency of plant species (grasses, shrubs, and trees) in each meter was estimated. Rock and other coarse ground material was also annotated.

Canopy density. The canopy density of trees and shrubs was measured using digital images of the vegetation according to the method described by Goodenough and Goodenough (2012), and partially modified by Farina & Pieretti (2014). A Coolpix 990 photo camera (Nikon™), pointed vertically and equipped with a Nikkor 8-24mm zoom lens, was utilized to take vertical photos of the vegetation strata from a height of 150cm. The images were captured in the place where the digital recorders were located and the process was repeated 10 times for every 2m in each of the four cardinal directions, with 40 images of the vegetation cover being obtained for each recording station. This method has some advantages, as argued by Goodenough and Goodenough (2012), if compared with, for instance, hemispherical photography (see, for instance, Rich, 1999) or other intercept methods (e.g. Blondel et al., 1973; Blondel and Cuvillier, 1977; Mueller-Dombois and Ellenberg, 1974, p. 84).

To calculate the canopy density, monochrome pictures of 640x480 pixels were converted into dark and light pixels (representing, respectively, the canopy and the sky) using the CanopyDig® software proposed by Goodenough and Goodenough (2012). The transformation of a monochrome image into a false colour image (blue = vegetation and red = sky) was carried out by choosing between eight images at different threshold values.

Canopy dispersion
The level of canopy dispersion was calculated by applying the Morisita index of dispersion (Morisita 1959, 1962). Each image was initially subdivided into 12 sub-images to calculate the canopy density. The number of pixels in each of the sub-divisions was calculated using the CanopyDig software according to the procedure suggested by Goodenough and Goodenough (2012). In more detail, the Morisita index of dispersion was calculated according to the following equation:

$$I_d = n\left(\frac{\sum_{i=1}^{n} X_i^2 - N}{N(N-1)}\right)$$

where n = the total number of sub-pictures
X_i = the number of the canopy pixels in each sub-picture *i*

N = the total number of canopy pixels in the entire image.

This index, the most important property of which is its independence from N, tends to increase with the rise in large gaps in an image. The Morisita index of dispersion is a robust measure of spatial distribution that is particularly applied to evaluate the dispersion of plants (for an example of the application of this index, see Myers, 1978, Nieder et al., 2000).

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