*forest*RE*plot*

A database of temperate forest ground layer resurvey plots

Content, terms of use and governance (v. 07/12/2018)

Background

Resurveys of historical vegetation plots are invaluable to document patterns of change in community composition and diversity and to better understand impacts of multiple and interacting global-change drivers. The relevance of repeated surveys (resurveys) is particularly high for communities exhibiting slow dynamics, such as ground layers in temperate forests. Furthermore, ground layers in temperate forests typically comprise a large fraction of the vascular plant diversity and are known to be strongly affected by various global-change drivers, including past land use, increased atmospheric deposition, climate change and changing management.

Gaining in-depth insights in the patterns and processes of change therefore requires many plots sampled over large environmental gradients. So far, no database exists that brings together forest understorey plant resurvey data collected at different locations and occasions in a harmonized way. In 2011, the first steps were taken to initiate such a database[1]. At meetings in Gent, BE (March 2013) and Průhonice, CZ (Sept. 2013) the basic purpose, aims and governance rules of the *forest*RE*plot* database were formulated. The database was formalized in late 2013. The first plenary meeting was held in Ghent (Dec. 2014). For the current status please check our website www.forestreplot.ugent.be.

*forest*RE*plot* aims

1. To collect datasets of resurveyed vegetation plots in temperate forests worldwide;
2. To perform analyses across multiple datasets aiming to answer actual issues in forest ecology with a specific focus on the ground layer.

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[1]Verheyen K *et al.* (2012) Driving factors behind the eutrophication signal in understorey plant communities of deciduous temperate forests. *Journal of Ecology* **100**:352-365.

The database

The database is a <u>collection of datasets</u> with plot based records of vascular plant species. Occurrence data (presence/absence or preferably cover/abundance) are available at least for the herb layer, but preferably also for the shrub and tree layers.

A dataset consists of plot-wise connected pairs of original records and (sometimes several) resurvey records. Datasets come from single forests, landscapes or regions, usually a clearly delineated area such as a forest complex or a landscape. Environmental conditions (i.e., atmospheric deposition, temperature, precipitation, bedrock geology, etc.) are more or less homogenous for each dataset.

Datasets should meet the following criteria:

- The climate is temperate as defined by the combination of the 'temperate broadleaf and mixed forest' and 'temperate conifer forest' biomes from Olsen *et al.* (2001) Bioscience, 51, 933-938 (see map on website). Transition zones (e.g. boreo-nemoral zone, mountains,…) are acceptable.
- Cover semi-natural[2] and/or natural[3] forests according to the FAO definitions (e.g. exclude fertilized, heavily managed plantations) where tree cover is the dominant matrix most of the time;
- Minimum sample size: about 20 plots per dataset;
- Minimum time span between the surveys: about 20 years;
- Plot size is between 1 m² and 1000 m²;
- Plots should not be pseudoreplicates, i.e. distributed over a sufficiently large area;
- Between the two surveys, no human-induced conversion to stand types no longer in line with the natural or semi-natural forest criteria has taken place (e.g. clearcutting and replanting with conifers on a site naturally dominated by broadleaves);
- Land-use history is known (i.e. ancient forest[4] or recent forest[5]);
- GPS coordinates of each plot are available.

All people with suitable datasets are encouraged to contribute data to the *forest*RE*plot*-database. Approval of the datasets is done by the management committee (MC). Upon approval by the MC the dataset contributor(s) will become a *forest*RE*plot*-member.

Technically the database is a collection of standardized Excel files including metadata, which can be easily compiled into the desired data-matrices using R-scripts.

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[2]Semi-natural forests can be defined as neither a forest undisturbed by man nor a plantation as defined separately. They represent mainly managed forests modified by man through silviculture and assisted regeneration (http://www.fao.org/docrep/005/y4171e/Y4171E47.htm) and may have been originally planted;

[3]A forest that has evolved and reproduced itself naturally from organisms previously established, and that has not been significantly altered by human activity. A natural forest may include, but is not equivalent to, an "old-growth forest." (http://www.fao.org/docrep/005/y4171e/Y4171E32.htm);

[4]Ancient forest: permanent forest land use since at least the first available land-use maps (typically mid 19th century or earlier); an ancient forest may include, but is not equivalent to, an old-growth forest;

[5]Recent forest: forest established on non-forest land (well) after the date of the first available land-use maps.

Governance[6]

The database is maintained by *forest*RE*plot*-members, organized at three levels regarding data contribution and decision making:

1. <u>Dataset contributor</u> is the person that has contributed a dataset and who is entitled to use the datasets within the framework of *forest*RE*plot*. It may be the author of the resurvey, sometimes also of the original survey.

2. <u>Dataset manager</u> is a dataset contributor responsible for completeness and correctness of data in a particular dataset. Dataset managers serve as contact and mediators between on the one hand other contributors of a particular dataset and, on the other hand, the management committee and lead-authors of publications.

3. <u>Management committee (MC)</u> is responsible for the management and updating of the database *forest*RE*plot* as defined above. Currently, the management committee consists of Kris Verheyen [Chair], Lander Baeten, Pieter De Frenne (all from Ghent, BE), Markus Bernhardt-Römermann (Jena, GE), Radim Hédl (Brno, CZ) and Don Waller (University Wisconsin-Madison, USA).

The *forest*RE*plot*-MC should consist of at least one member per continent represented in the *forest*RE*plot*-database. Currently the MC consists of six members

Election of the MC is done by the *Forest*RE*plot*-members. Elections take place for 2-year renewable terms in January of even years by means of an electronic ballot extending over one month[7]. The six candidates with the highest number of votes are elected; in case of a tie for the sixth position, all persons with the same number of votes are elected. The MC determines one of its members as chairperson.

The MC is responsible for overseeing the everyday business of *forest*RE*plot* and for handling any issues not specifically assigned otherwise in this document.

The MC is responsible to make the amendments to this document, but all changes should be approved (by a simple majority) by the members of *forest*RE*plot*.

Terms of use and authorship arrangements

Use of the *forest*RE*plot*-database is subject to the following conditions:

- The datasets within the *forest*RE*plot* database are open for use by anyone;
- The "power of decision" concerning a dataset remains with the respective dataset contributors;
- Permission to use the dataset needs to be asked every time a dataset is used. Writing high quality publications is the main purpose of the *forest*RE*plot*-database, but datasets can also be used for e.g. teaching purposes;
- Dataset contributors can, if desired, also release their datasets within the database as "open access". In this case no permission needs to be asked and the dataset can freely be used within the *forest*RE*plot* group;

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[6] Inspired by the sPlot Working Group Governance and Data Property Rules (http://www.idiv-biodiversity.de/sdiv/workshops/workshops-2013/splot/materials)

[7] Next elections will take place in January 2020

- Dataset contributors can withdraw their dataset from the *forest*RE*plot*-database, but are then no longer a *forest*RE*plot*-member. Membership can also be terminated by a two-thirds decision of the MC if a dataset contributor has seriously violated the conditions; External persons are not allowed to use the data; i.e. data access is only granted to *forest*RE*plot*-member;
- Under no circumstances can data received via the *forest*RE*plot*-database be circulated to other people.

- Co-authorship is offered to the dataset contributor every time his/her dataset is used to write a publication;
- The dataset manager has the responsibility to check with possible other contributors involved in a particular dataset whether or not they should be offered a co-authorship as well;
- All persons that will act as co-author are expected to, at least, review and explicitly approve the publication. If a dataset contributor has initially agreed that his/her data can be used, and this data contributor does not respond to emails with a publication approval request or does not agree with the contents of a publication, his/her data can still be used for that particular publication project and he/she will be deleted as a co-author (because when submitting a publication, the lead author has to declare that all authors have agreed on its contents);
- Publication proposals (including a preliminary title, brief outline, time line, core group of people working with the data, which datasets will be used + the criteria that have been used to select the datasets) have to be sent to the MC. If the MC finds no conflict of interests with other ongoing or planned proposals, the MC contacts dataset managers for dataset access, compiles the approved data and sends them to the proposer.