EDGG Field Workshop: instructions for field measurements

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Placement of plots (biodiversity and normal)

- Choose visually homogenous stands (regarding slope, aspect and vegetation).
- In each study area place the plots so that together they cover the full regional gradient in environmental conditions and floristic composition.
- Arrange your plots along cardinal directions, i.e. exactly North-South. If this is not possible for homogeneity criteria, note the deviation from North-South direction (= 0°) on the form under "Orientation" in degrees, e.g. if the plot is oriented NNW – SSE you would note −22.5°.
- If possible two or four corners of the biodiversity plots and one corner (specify on the form which this is!) should be marked by burrowing magnets to be able to conduct a precise revisitation study in the future.

Particularities of biodiversity plots

- To achieve a perfect square with an edge length of 10 m, first establish the diagonal with 14.14 m (in NW-SE direction).
- Place two series of nested plots in two opposite corners (NW and SE), with edge lengths of 1 cm, 3.2 cm, 10 cm, 32 cm, 100 cm and 316 cm. Occasionally NE and SW might be used instead.

Coordinates

- Set you GPS to
  - Coordinate system **decimal degrees** (hhd.ddddd°)
  - Geoid **WGS 84** and
  - Unit of measurement **metres** (m)
- If available, use the averaging function of your GPS to achieve higher precision of measurement. Note the precision of the measurement in m (if provided by the GPS) or alternatively "averaged" or "non-averaged".
- In addition to writing down the coordinates, store them also in the GPS (this gives some redundancy and might enable to get the geographic coordinates with less effort).
- Indicate at which of the corners (SW, NW, SE, NE, centre) you placed the GPS for measurement.

Plant recording

- We record with the shoot presence (= any part) system, i.e. each plant species who are either rooting inside the plot or the vertical projections of whose shoots fall within the plot is recorded as present.
- For the biodiversity plots (particularly at the smaller grain sizes) take care that the spatial arrangement of plant parts is not disturbed by placing the tapes and pins or by searching for low-growing plants (i.e. before disturbing the higher layer you should establish which species had shoot presence there).
- Cover value is recorded for all living superficial parts of plants; dead individual of spring ephemerals (annuals, geophytes) from the same year are counted as living.
- Herbaceous plants are always recorded in the herb layer irrespective of their height; woody plants are assigned to layers depending on their size (< 0.5 m vs. > 0.5 m).

- Please always double-check that the cumulative cover values of all species of a group are at least as high as the cover value of that group (usually they are 1.5−2x as high). For example, when summing up the individual cover values of all graminoid species, the value should be higher than the graminoid cover given in the header.

Collection of undetermined plants

- If plants cannot be determined in the field for sure, sample them in paper bags separately for vascular plants, bryophytes and lichens (label the later bags with a big "B" and "L" respectively). Note on the record form which plants have been collected by circling the number.
- In the case of biodiversity plots, ensure that plants are sampled in separate bags for each plot size and for each corner.
- Ensure that the plant bags carry full plot number and date, plus in the case of biodiversity plots the subplot size and the corner.

Vegetation structure and biomass

- Vegetation height is measured with the pierced discs by letting them fall down the "penetrometer" at five random places within each 10-m² plot (note the height at the hole using the scale on the penetrometer). This should be done before looking for plants on the 10-m² plot because measurements otherwise will be biased by trampling!
- Biomass is sampled and pooled from two random locations within each 10-m² plot. For that, in each selected location, a square of 20 cm x 20 cm size is delimited by pushing an iron sampling frame (or a square formed by the folding rule) down to the ground. All biomass rooting inside the frame (note that here rooting presence, not shoot presence is used, unlike species records.) As a standard standing vascular plant biomass, non-vascular plant biomass and litter are pooled to one sample from both subplots. But in cases resources allow separate analysis, they might alternatively be collected as three separate subsamples.

Abiotic factors

- Slope (in °) is best measured by placing the inclinometer on the penetrometer put on the soil along the main gradient.
- Microrelief (in cm) is the maximum deviation from the penetrometer placed on the elevated parts of the surface to the actual soil surface, measured perpendicular to the penetrometer (not perpendicular to the earth).
- Cover of litter and dead wood should be assessed after virtually removing all living plants, i.e. not only the litter that is seen in vegetation gaps.
- Surface cover of the three fractions of the mineral soil should be assessed after virtually removing all living plants, litter and dead wood. Thus stones/rocks, gravel and fine soil should sum up to 100%.
- Soil depth is measured at five random places in the plot (note "0 cm" when hitting a superficial stone and something like "> 85 cm" when the soil depth exceeds the length of the penetrometer. Please note all five measurements separately (no averaging!).
- Land use information is of high importance for analyses. Therefore not any information on present and past land use (mowing, grazing, abandonment, burning, ploughing) you can retrieve in the field as precise as possible. Further details can be provided in line "Comments".

Soil samples

- Take a mixed soil sample of the uppermost 10 cm of soil (removing litter, but not gravel and stones) from five random points in the plot. You should thoroughly mix the sample and then reduce it to approx. 100–200 g.
- Label the bags well readable with full plot number and date.
- In the evenings open the soil samples for drying and check their correct numbering and completeness.

Recording forms

- Please ensure that plot numbers are neither duplicated nor missing by using pre-numbered sheets and returning unused numbered sheets every evening to the expedition leader.
- Specify the person who wrote the protocol (might be contacted when something is unreadable).
- When relevé continues on a second page ensure that full plot number and page are repeated (the pages will be scanned individually, so each page must have a unique identifier).
- Before finishing a relevé, please ensure that all header data are filled in!
- Don’t write too near to the margins; otherwise information might get lost when the forms are scanned and hole-punched.
- Every evening all record forms will be collected and cross-checked for numbering.