



FunDivEUROPE

Functional significance of forest biodiversity in Europe

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Measurements and assessment of dead wood quantity and quality

FunDivEUROPE (FP7) field protocol

V1.0

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1 Introduction

Dead wood plays an important role in element cycling (carbon, nutrients, water, etc.) and the build-up of carbon and nutrient stocks. It also represents an important structural component of forests, providing habitat for a large variety of organisms with often highly specialized habitat requirements (e.g. xylobiontic beetles). Both dead wood quantity and quality as well as its chemical and structural diversity are assumed to be linked to tree diversity. Occurrence of deadwood is regarded as one of the key parameters for forest functional diversity. The presented protocol has been compiled based on the protocol 'Stand structure assessment including dead wood' within the EU/ICP Forest Biodiversity (Forest BIOTA) with some minor adjustments to the needs of the project.

2 Scope and application

The protocol has the aim to standardize measurement and assessment of dead wood amount at sites of the Exploratory Platform within FunDivEUROPE Project framework.

3 Objectives

Coarse woody debris (CWD) in different phases of decaying is an important sink for carbon and nitrogen, thus thorough assessment of its amount at the site gives an estimation of the amounts of stored elements as well as modifies nutrient cycling assessment. Sampling of different tree species dead wood in different phases of decay will allow for assessment of amount of stored elements in relation to stand structure and species composition. Additionally CWD is a habitat and substratum for development of many organisms and increases species diversity of forest ecosystems. We expect that larger amounts of dead wood will allow for development of richer communities of soil fauna and other organisms. Dead wood measurements will be correlated with data gathered by other teams.

4 Location of measurements and sampling

4.1 Number of replicates

Measurement will be carried at all plots. If CWD is not present, measurement and sampling will be limited to tree stumps and smaller dead wood elements lying on the forest floor.

4.2 Sampling scheme

Standing and downed CWD will be measured at the entire plot. Additionally at four circle subplots ($r = 7$ m) centred in the knots of 12.5 m grid we will measure lying dead wood pieces and stumps (see Fig. 1).

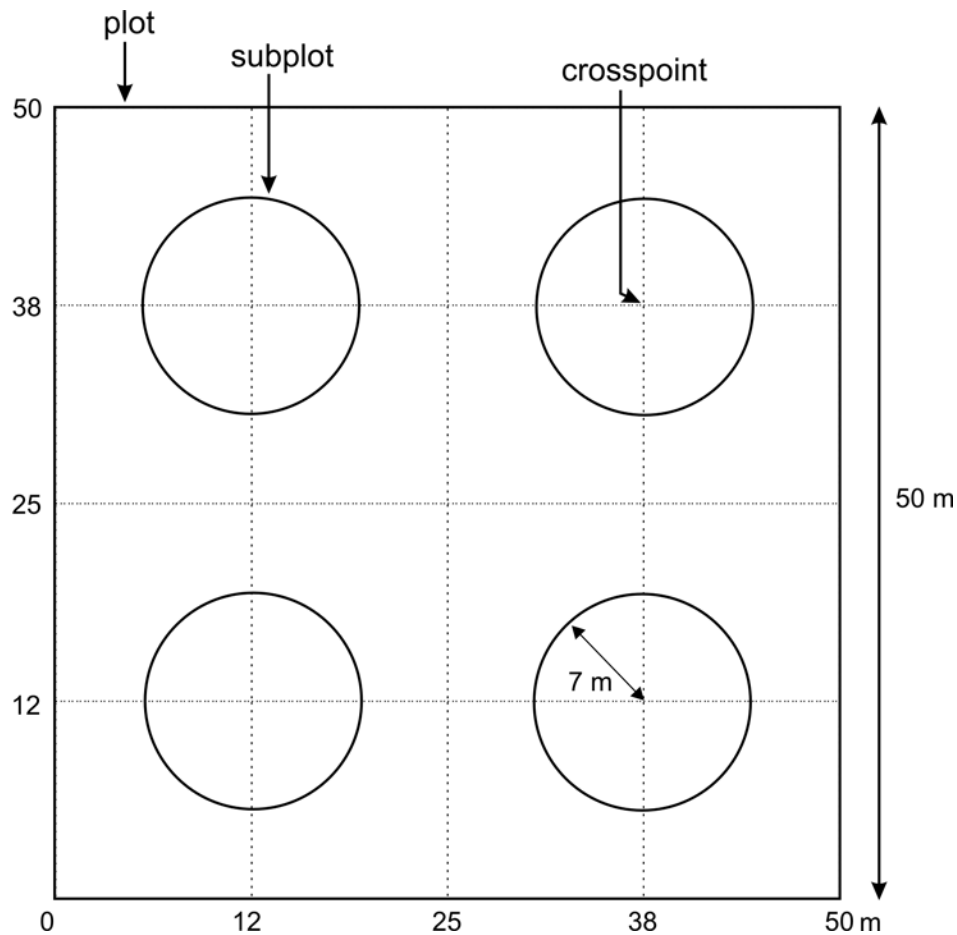


Figure 1: Plot and subplot design for dead wood inventory and sampling.

4.3 Sampling equipment:

- Laser rangefinder (can be replaced by measuring tape and clinometer);
- Calliper;
- Knife;
- Accu drill;
- Saw.

4.4 Frequency of sampling

Sampling will be carried out only once; however future measurement and sampling (beyond the FunDivEUROPE time period) can bring very important and unique information on speed of decay and temporal pattern of C and N stocks variability at the stand level.

4.5 Sample collection, transport and storage – quality control in the field and between plots and sites

Approximately 5 ccm of wood saw dust obtained by drilling or sawing will be sampled for each tree species (dead wood) and each phase of decay present at plot. Samples must be taken from those fragments of CWD which in the best way will characterize species and

phase of decay traits. Samples will be placed into plastic containers. It would be recommended to store samples in the refrigerator. Quality control will be carried in the field by PhD student.

5 Measurements

5.1 Standing dead wood (the entire plot)

A dead tree/snag is inventoried if its DBH > 5 cm and its stem base lies within plot limits. In commercial forests harvested wood (prepared for removal) is not measured! Snags are measured if their height is over 1.3 m.

Inventoried attributes: DBH (with or without bark); height; species; decay phase. For snags additionally diameter at half of height (if reachable) is measured.

5.2 Dead downed trees (the entire plot)

A downed tree (in one piece or in many pieces recognizable as one tree) is inventoried if its diameter in the thicker end is 10 cm or over and the thickest part of the stem lies within the plot boundaries.

Inventoried attributes: diameter at the thicker end (with or without bark) at the place, where base of the tree doesn't show influence of side roots; length; species; decay phase.

5.3 Other dead wood fragments (subplots)

A lying wood piece is inventoried if its diameter at thicker end is > 5 cm, its length is > 1 m, and its thicker end lies within the subplot limits. If the piece contains several branches, each of them is treated as separate piece of wood (their diameter at thicker end must be > 5cm).

Inventoried attributes: total length of piece from the thicker end up to the point, where its diameter drops below 3 cm; median diameter (at half of the length); species; decay phase.

5.4 Stumps (subplots)

A stump is inventoried if its diameter at the height, where tree was cut/broken is > 10 cm, its height is <1.3 m and more than 50% of the base lies within the subplot boundaries.

Inventoried attributes: diameter of the stump at the place, where tree was cut/broken; stump height; species; phase of decay.

6 Template for a data sheet:

Site: *Białowieża/PL* Date: 12.07.2011 Observer: *Johny Woodborer*

Plot no.: *PL-1*

Tree No.	Subplot No.	Species	Character (standing, dawning, piece, stump)	Phase of decay [1-5]	Diameter [cm]	Length /height [m]	Sample/ Notice
1	-	QURO	Standing	3	43.5	24.78	PL-1/ QURO/ 3 (plot no./ species/ decay level)

7 References

Anonymous. 2008. Stand structure assessments including dead wood within the EU/ICP Forests Biodiversity Test Phase (ForestBIOTA).