FunDivEUROPE

Functional significance of forest biodiversity in Europe

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Assessment of habitat use by mammalian herbivores

FunDivEUROPE (FP7) field protocol

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1 Introduction

Mammalian herbivores exhibit clear preferences for particular types of habitats, which in turn determine the location and amount of browsing damage that they cause. Habitat use by mammalian herbivores may be affected by many factors, e.g. tree and understorey density, presence of preferred plant species, risk of predation, microclimate etc. Tree species diversity of the stand is likely to affect all of the above factors and hence is likely to influence mammalian habitat use patterns. While many methods of assessment of habitat use by mammalian herbivores exist, we will be using the two (faecal pellet counting and rooting by wild boar) which are least time consuming and allow assessment of cumulative mammalian herbivore activities over long periods of time (hence no need to repeat the measurements several times per year).

2 Scope and application

Studies of habitat use by mammalian herbivores will be conducted mainly in Exploratory Platform because majority of Experimental sites are fenced to exclude mammalian herbivory and inventories are unlikely to provide comparable and sufficient information on damage agents.

3 Objectives

To compare relative habitat use of low and high diversity plots by mammalian herbivores.

4 Location of measurements and sampling

4.1 Field sampling design and number of replicates

Faecal pellet counting:

- 3 circular measurement plots with 5 m radius (78.5 m^2) per plot.

Rooting by wild boar:

- Number and area of rooted patches per plot.

4.2 Frequency of sampling

Habitat use by mammalian herbivores will be monitored once a year in each Exploratory region. The best time for faecal pellet counting rooting by wild boar in boreal and temperate regions is spring after the snowmelt (easier to see faecal pellets before the ground vegetation becomes dense).

5 Measurements

5.1 Faecal pellet counting

Faecal pellet counting provides an estimate of relative habitat use and relative abundance of different species of mammalian herbivores (Neff 1968). For Exploratory Platform, at each of the 50 plots per region we would select three systematically spaced (e.g. as corners of the triangular) circular measurement plots with 5 m radius (78.5 m^2) (Noor et al. 2010). A tree serving as a centre of each measurement plot will be tagged. Measurement plot boundaries will be delineated using a 5 m rope attached to and rotated around the central tree. Number of all faecal pellets by hare and number of pellet groups (at least 20 pellets per group) by each species of ungulates per measurement plot will be counted. Droppings of different species will be identified using the field guide by Bang and Dahlstrom (2006). Pellet groups located on the edge of a measurement plot have to have 50% or more of the group within the plot to be counted. After each count all faecal pellets will be removed from the measurement plots to prevent counting the same pellets again at the next monitoring.

5.2 Rooting by wild boar

Wild boar is present in majority of the Exploratory Platform regions. A substantial proportion of wild boar diet is obtained searching for roots, bulbs and other below-ground material by rooting, which entails breaking through the surface layer of vegetation, followed by excavation to a depth typically ranging between 5±15 cm. The displaced vegetation and soil may be left in place or may be moved away, smothering otherwise intact vegetation. Rooted areas may extend for 1 ha or more, but typically comprise many small (1 m^2), more or less overlapping disturbed patches. Rooting by wild boar creates soil disturbance which is beneficial for some annual plant species, but may negatively affect regeneration of some tree species such as oaks and beech (Groot Bruinderink and Hazebroek 1996). In forests, rooted patches may remain detectable for several years. Most rooting occurs from mid-autumn to early spring, making late spring/early summer the best time to record rooting.

All 40 Exploratory plots in regions where wild boar occurs (Poland, Italy, Spain, Germany, Romania) will be monitored once per year in late spring/early summer and the number and area of rooted patches per plot and excavation depth will be estimated. This measure will provide an estimate of relative habitat use by wild boar in low and high diversity forest stands.

6 Template for a data sheet

Template for a data sheet for recording faecal pellets and rooting by wild boar (plot-specific).

Date	Recorder	Region	Plot No	Diversity level	Measurement Plot No	Mammal Species ID	No of faecal pellets	No of rooted patches	Total areas of rooted patches	Depth of excavation (cm)
					1-3					

7 References

Bang, P. and Dahlstrom, P. (2006). Animal tracks and signs. Oxford University Press, 264 p.

Groot Bruinderink, G.W.T.A and Hazebroek, E. (1996). Wild boar (*Sus scrofa scrofa* L.) rooting and forest regeneration on podzolic soils in the Netherlands. *Forest Ecology and Management* **88**: 71-80.

Neff, D. J. (1968). The pellet-group count technique for big game trend, census, and distribution: a review. *Journal of Wildlife Management* **32**, 597-614.

Noor A., Habib B., Kumar S. (2010) Effects of plot size and shape on the encounter rate of ungulate faecal pellet groups and abundance estimate precision. *Current Science* **99**: 800-804.