

Monitoring of biodiversity in the core zones of Biosphere Reserve Wienerwald

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Keywords

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Abstract

The Wienerwald is situated in eastern Austria, in the federal states of Lower Austria and Vienna and is recognised by the UNESCO as a Biosphere Reserve since 2005. The Reserve covers an area of 1.050 km² and 51 communities in Lower Austria as well as 7 districts in Vienna. Goals of Biosphere Reserves are to sustainably establish protection of biodiversity, to pursue economic and social development and to preserve cultural values.

The Wienerwald is the largest contiguous broad leaved forest in Central Europe. It is dominated by vast beech forests of different types, from thermo- and calciphilous *Cyclamini-Fagetum* to mesophilous *Mercuriali-Fagetum* and *Galio odorati-Fagetum* to acidophilous *Melampyro-Fagetum*. The second most frequent forest type is oak-hornbeam forest of *Galio sylvatici-Carpinetum*. Furthermore, the largest downy oak forest in Austria and sub-mediterranean pine forests with endemic Austrian Pine (*Pinus nigra ssp. nigra*) are found in the Biosphere Reserve. The altitudinal range of the “Wienerwald” extends from 160m at the edge of the Pannonic Basin up to 893m in the western part of the Sandstone-Wienerwald.

The Biosphere Reserve „Wienerwald“ has 37 core zones with a total area of about 5.500 ha guaranteeing long-term protection and natural succession of the different forest types of the Wienerwald. The core zones are established as nature reserves in Lower Austria and as landscape preservation areas in Vienna. Moreover large areas are identified as European Reserve Area (Natura 2000).

The monitoring program in the core zones started in April 2012 and continues in its primary phase of data collection until end of 2013. The monitoring program comprises the following organismic groups: lichens (80 plots), fungi (120 plots), mosses (60 plots), vascular plants (500 plots), terrestrial snails (42 plots), pseudoscorpions (45 plots), spiders (45 plots), harvestmen (*Opiliones* – 45 plots), ground beetle (*Carabidae* – 45 plots), saproxylic beetles (45 plots), amphibians (78 plots), birds (400 plots) and bats (168 plots). In 28 monitoring plots in the core zone and in 14 monitoring plots in the commercial forests all 13 organismic groups are covered.

The establishment and organismic inventory of monitoring plots is a necessary basis for collection of evidence-based data in nature protection. To validate the biodiversity- data of the core zones it is useful to establish monitoring plots also in the adjacent commercial forests of the Biosphere Reserve. In total there are 335 monitoring plots in the core zones and 168 outside the core zones in commercial forests, but inside the borders of the Biosphere Reserve. The standard size of monitoring plots is set as 400m² with adaptations for fungi, mosses and lichens, where sampling is extended to a 100m radius from the center of the monitoring plot if there are ecologically important special structures like outcrops or scree. Bird data is partially collected in transects between monitoring plots, due to the highly vagile character of this group.

Out of approx.1700 sample points of the forestry stand inventory inside the core zones 20% have been chosen by stratified sampling as organismic monitoring plots. Parameters for stratification contained plant community, exposition, lying deadwood >50 cm, geological microstructures, stand age, tree-species diversity, standing deadwood, density of the stand, and maximum diameter of trees. Different sets of parameters for stratification were chosen according to different organismic groups. So each point of the forestry stand inventory was ranked for each organismic group. The points with the highest total ranking over all organismic groups for each core zone have been chosen as monitoring plots. Minor corrections have been made in a subsequent step regarding the representation of vegetation units, so all forest types of the Wienerwald are represented with at least one monitoring plot.

The monitoring plots outside the core zones have been chosen by generating a point raster shape in GIS with a grid width of 100 x 100m, including information about the geological unit, exposition, inclination and elevation. For 50% of the monitoring plots inside the core zone (i.e. forestry stand inventory points with the highest ranking), the respectively nearest point from the point raster outside the core zone with matching abiotic parameters has been chosen as monitoring plot.

After finishing the basic inventory in 2015, further monitoring should be carried out in 2023.

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