

Nature without barriers – Natura2000 sites as Green Infrastructure in the Austrian-Hungarian transborder region Fertö-Hansag-Neusiedlersee

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Abstract

Many ongoing processes in today's landscapes impact our environment considerably. Thus, it is enormously important to gather information on qualitative characteristics of our landscapes in order to effectively counteract the negative development. Structural functionality as proxy for the assessment of habitat quality and species patterns has already proven potential to successfully describe ecological values. Completed by the measurement of green infrastructure information for a defined profile of a functional trait, a rapid and rough assessment of the qualitative state of habitats seems feasible. We therefore present in this study (i) an assessment of structural functionality based on the statistical analysis of landscape metrics, (ii) the measurement of green infrastructure and travelling costs for the ecoprofile of Disturbance Sensitive Group and (iii) an investigation if functionality and green infrastructure change between different types of landscapes and protection status. In the region of Neusiedler See (Austria), we selected 41 landscape samples based on a stratified random process. Based on orthophoto interpretation, we calculated landscape metrics with FRAGSTATS and reduced them to a core set of 13 indices by combining statistical results with literature review. Their relation to main ecological processes determined if the individual metric related positively or negatively with the land cover category and structural functionality was given by the average value of the landscape metrics. Green infrastructure was allocated with GUIDOS, whereas the travelling costs to move between the infrastructure was calculated with PATHMATRIX. Landscape elements of valuable matrix and connecting corridors ranked highest in structural functionality based on the calculated landscape indices but showed large differences between different land use regimes. Correlation and regression analysis confirmed the dependence of Green Infrastructure elements as well as travelling costs to functionality values. Protection status of the landscape samples proved to be a determining factor because functionality values as well as Green Infrastructure differed significantly (both with a p -value < 0.05) with the exception of dissecting corridors, stepping stones and travelling costs. We conclude that one simple guideline for a holistic assessment of structural functionality is hardly reachable but we set up a comprehensive rule set. Based on a transparent sampling procedure, a qualitative assessment of habitats and landscapes can easily be conducted. The complementary use of an ecoprofile enables the valuation of green infrastructure elements and the identification of major driving forces along with scenario development for sustainable landscape planning.

Keywords

Landscape metrics, morphological spatial pattern analysis, nature protection, travelling costs, landscape pattern, Fertö-Hansag-Neusiedlersee