URBAN AND PERIURBAN FOREST HABITAT SUITABILITY: CURRENT FITNESS AND FUTURE TRENDS UNDER CLIMATE CHANGE SCENARIO

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Abstract

Distribution models have been largely discussed and debated in the last two decades (Austin, 2007). Suitability maps are distribution model outputs and represent the degree of the affinity between a specific biota and its environment in terms of presence / absence probability. Future trend of species suitability are estimated and mapped using climate change scenarios to evaluate vegetation shift: potentially, decreased affinity leads to species fragility and extinction while increased affinity leads to expansion of a species in a determined area.

Suitability maps applications on conservation issues and assessment of climate change impacts on rural and wilderness landscapes are well documented in literature. Lindenmayer *et al*. (2008) suggests how to include such maps in a general framework of proactive planning for landscape management. To our knowledge no application has been yet proposed specifically dedicated to recreational forested areas. Here we propose to assess the actual and future suitability of European dominant trees and forest types covering urban and periurban forests. Our results may furbish additional input guidelines in decision making when dealing with recreational forest management.

For this purpose, a set of Classification Tree models (Breiman *et al*. 1984) were constructed for the 20 most common European tree species and for Forest types (c.f. forest categories defined according to EEA technical report n9/2006).

Models are built at the European extent to integrate the whole species range and estimate correctly the biota's ecological niche. Habitat suitability distribution output maps of 1km resolution were plotted in Urban and Periurban Forested areas to assess actual fitness of species to their environment. 10 European capitals including Berlin, Brussels, Helsinki, Ljubljana, London, Madrid, Paris, Prague, Rome and Vienna were taken into account. Finally, the IPCC SRES A1B future scenario was applied to the suitability model and we tested trends of vegetation suitability shift for the next century. Results show that European urban forests are partially unfitted to current conditions, and that there will be a general trend of suitability changes in the next century. These trends could force recreational forest management schemes and practices to adapt to a pressure of landscape changes at local level.

Key Words

Habitat suitability maps, Classification Tree model, European capitals recreational forests.

Key References

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