Abstract

Green corridors are increasingly recognized as a key component of green infrastructure in spatial and landscape planning, particularly in the context of sustainable development, active mobility, and the functional integration of urban, rural, and natural areas. They are commonly defined as linear spatial elements that ensure the continuity of ecological, recreational, and social functions while simultaneously connecting settlements, natural habitats, and cultural landscapes. Within contemporary European planning frameworks, green corridors are promoted as multifunctional spatial tools that contribute to biodiversity conservation, climate adaptation, and improved quality of life for local communities.

This paper presents a methodological and applied framework for planning a network of green corridors, based on the integration of existing transport and forest infrastructure and the application of selected park design techniques. The research was conducted in a spatially heterogeneous region characterized by extensive forest complexes, river valleys, agricultural land, and dispersed settlements. Such spatial conditions create favorable prerequisites for the development of green corridors, but also pose challenges related to depopulation, limited mobility options, and fragmented planning approaches.

The main objective of the study was to analyze the possibilities of establishing a functional network of green corridors by using the existing infrastructure with minimal spatial intervention. Special emphasis was placed on the role of forestry expertise in spatial connectivity, landscape interpretation, and sustainable use of forest road networks. The specific objectives were to (i) identify and analyze the spatial characteristics of fifteen proposed green corridors, (ii) determine suitable trail profiles and park techniques in relation to different spatial contexts, (iii) present a synthetic overview of planning solutions through a comparative table, and (iv) discuss the contribution of forestry professionals to interdisciplinary green infrastructure planning.

The research methodology combined desk-based spatial analysis, field observations, and the synthesis of professional planning criteria. The existing road networks, including local, unclassified, and forest roads, were analyzed and classified according to their potential for pedestrian and cycling use. Forest infrastructure was interpreted not only as a production-oriented system but also as a valuable spatial resource for recreational and connective functions. Based on spatial context and functional requirements, four basic trail profile types (S-TIP 1–4) were defined (Figures 1–4) and applied across the analyzed corridors.

The results are presented through a comprehensive table (Table 1) that summarizes the key characteristics of all sixteen green corridors, including corridor designation, start and end points, categories of transport infrastructure, applied trail profiles, planned park techniques, dominant functions, and spatial contribution. The analysis demonstrates that most corridors rely on a combination of existing local roads and primary or secondary forest roads, confirming that functional green corridors can be established without extensive new infrastructure development (Figure 5). Trail profiles are clearly differentiated according to spatial context: urban and peri-urban areas predominantly require separated or traffic-calmed profiles, while rural and forested areas allow for more flexible and low-impact solutions.

Planned park techniques are intentionally modest and context-sensitive, focusing on rest areas, interpretative panels, viewpoints, and simple park elements. This approach emphasizes spatial connectivity and legibility over intensive park equipment, reinforcing the multifunctional nature of green corridors. The study also highlights the importance of forestry professionals in planning processes, particularly in integrating forest roads into green infrastructure networks in a way that preserves ecological, production, and social forest functions.

The discussion places the results within a broader interdisciplinary context, linking forestry, spatial planning, landscape architecture, and sustainable mobility. Green corridors are interpreted not merely as recreational trails, but as spatial structures that support active mobility, cultural and natural heritage interpretation, and balanced regional development. The proposed methodological framework demonstrates transferability and can be applied in other regions with similar spatial characteristics.

In conclusion, the paper confirms that green corridor planning based on the existing infrastructure and forestry expertise represents an effective and sustainable approach to spatial connectivity. The presented methodology and results provide a practical planning tool and a professional basis for further development of green infrastructure networks, while also supporting a stronger role of forestry professionals in interdisciplinary spatial planning and landscape management.

Keywords: green corridors, sustainable development, spatial connectivity, park techniques, spatial planning methodology