INTEGRATION OF ENVIRONMENTAL EDUCATION AND RECREATIONAL ACTIVITIES IN THE RYBNÍK FOREST PARK REVITALIZATION PROJECT

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Abstract
The paper focuses on landscape-architectural solutions with an emphasis on promoting recreational activities in the forest park Rybník. The proposed solutions integrate various artistic elements of a natural character into the park's environment to enhance its aesthetic value and overall attractiveness. The aim is to create a multifunctional space that offers diverse opportunities for relaxation, recreation, and education for visitors of all age groups.
The educational aspect of the space will allow children to engage with nature in a fun and interactive way. The introduction of new features and activities will contribute to improving the quality of life in the area, enhancing the landscape character, and creating an appealing leisure space for visitors.
The design proposals are inspired by local natural elements, as well as the region's wine and fruit-growing traditions. The project, which explores various alternative solutions with an emphasis on recreation, was developed in collaboration with students from the Institute of Landscape Architecture at the Slovak University of Agriculture in Nitra for the Communal Land Association Rybník.

Key words: biodiversity, education, landscape architecture, nature, traditions

Introduction
The integration of environmental education with recreational activities offers an effective approach to raising environmental awareness among broad segments of the population. This integration allows participants to directly experience and appreciate nature, observe changes in the natural environment, gain a deeper understanding of environmental issues, and promote sustainable behavior within their communities (Zint et al., 2014).
Studies suggest that outdoor activities enhance engagement and encourage proactive behavior (McCool et al., 2020; Szczytko et al., 2020). Learning in nature is more engaging and effective because it helps connect theoretical knowledge with hands-on experience (Kilgo et al., 2015; Kuo, Browning & Penner, 2018). Programs that combine activities such as cycling tours and camping with lessons about local ecosystems enable participants to link academic concepts to real-world experiences. Participating in sustainability practices—such as recycling and water conservation at recreational centers—teaches practical approaches to sustainable living and can instill habits that participants carry into their everyday lives (Halsall & Forneris, 2019).
A range of implementation strategies are employed, including interdisciplinary education (Kuo et al., 2018), the integration of environmental content into education curricula, and the combination of environmental education with outdoor recreation. Community-based initiatives, also serve to link recreational activities with environmental learning.
This study presents a landscape-architectural design for the Rybník forest park, located near the Protected Landscape Area Štiavnické Highlands. The site features gentle sloping terrain with scenic viewpoints overlooking the surrounding countryside, and a combination of open spaces and forest stands. Its advantages include good accessibility for pedestrians, cyclists, and motor vehicle visitors. The aim of the study is to utilize the site's potential for leisure activities for visitors of all ages, promote environmental awareness, and reflect local traditions."
The design was prepared upon the initiative of the Administration of the Communal Land Association in Rybník, which holds ownership of the land within the area under consideration."

Material and methods
The cadastral area of village Rybník is located in Nitra Region (Fig. 1). The territory is located at the interface of two orographic and landscape units: the Inner Carpathians – Štiavnické Highlands (northern part of the area), the Pohronská Uplands and the Hronská Niva (southern part of the area). In terms of climatic characteristics (Lapin, 2002), it is a warm, moderately dry area with mild winters and sum of annual precipitation ranges between 600–700 mm. The territory is classified as an area of plains and lowlands with a reduced occurrence of fog and little affected by inversions (Lapin, 2002). The Hron River flows along the western border of the cadastre, its small tributary Teplička flows

through the middle of the cadastral area, and the Rybnický Potok fows along the eastern cadastral border.
The area under consideration is located outside the built-up area of the village, approximately 2 km far from the village center, and it is accessible by an asphalt road and hiking trails. The location offers many nice places to relax and views of the surroundings. The total extent of the area is 10.26 ha
The south part is predominantly covered by forest and belongs under the Devičany forest management unit. While the north part of the studied area has open landscape with permanent grassland without continual tree cover. This location offers many nice views and places to relax. Potential threats to the design can be be waterlogged areas and a lot of dead trees, which should be secured to reduce risk on acceptable level.

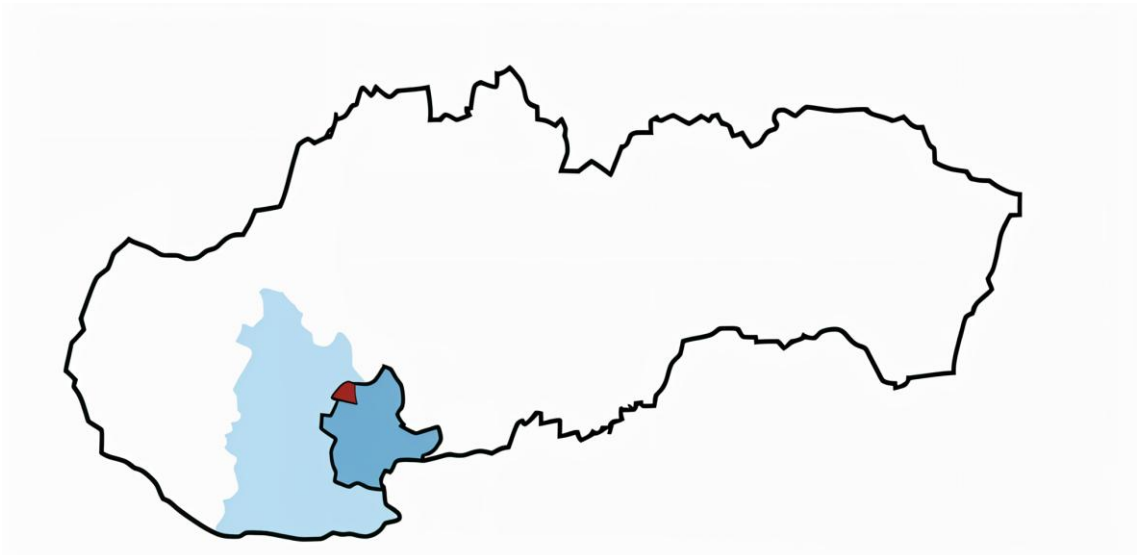

Fig. 1 : Location of the area under consideration (red) within the Nitra Self-Governing Region (blue) in Slovak Republic

The village Rybník has a more than two-century tradition of growing grapes, which is documented by one of the oldest written records in Slovakia. In the 18th century, the area was mainly composed of permanent grasslands, vineyards were located in the eastern part, and viticulture there was maintained also in the 19th century (Fig.2). Historically a large part of the built-up area consisted of pastures with scattered grown oak trees. Wetland areas of the territory that were not suitable for agricultural purposes were covered by groves (Fig. 2). Over time, the built-up area of the village expanded, often occupying land that had previously served as pasture. This transformation is evident in historical maps from 1839, where the settlement is referred to as *Ribnjk u. Garam Szöllös*.
About 2/3 of the area under consideration is covered by oak forest crops and the rest is grassland. The vineyards have been preserved in the adjacent territory with significantly reduced area (107 ha) at half occupied by small-scale growers.
The conceptual design of a landscape-architectural solution in the Rybník forest park was a practical assignment for students of the Landscape Design Studio of the Institute of Landscape Architecture of the Slovak University of Agriculture in Nitra. Using the research by design approach, the key design principles were defined, that students apply in their designs. The method is divided into two main parts: 1) analysis (broader relationships, historical, functional, spatial, visual and landscape analysis, as well as mapping of woody vegetation. 2) design (students worked in design groups, which resulted in various design concepts, divided into functional recreational zones of the Rybník forest park (Kuczman et al., 2024).

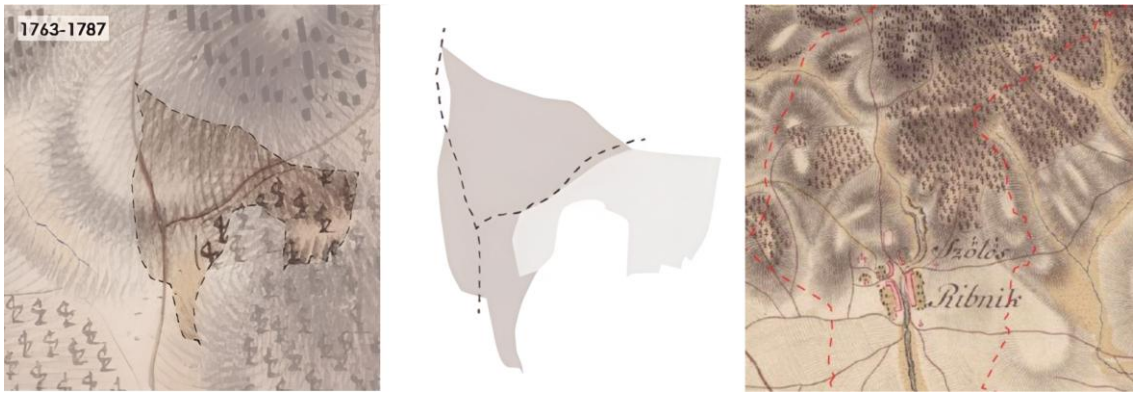

Fig. 2: The historical map of the settled area with vineyards 1763-1787 (Left) (Source: https://maps.arcanum.com). Trail through the area of interest on a historical map (Center). A historical analysis of the area based on cartographic records from 1783 indicates that tree groves extended from the northern part of the territory up to the boundaries of the village's built-up area (Kuczman, G., et al., 2024).

Results

The studio's output resulted in alternative design concepts defining several functional zones in the Rybník forest park. The proposals applied innovative and nature-friendly solutions aimed at restoring recreation for people, preserving biodiversity, and improving water infiltration in the area of interest. An important step in the design process was the creation of a new trail route that connected to existing green areas and water features. The shape of the new trail route was based on the shape of a vine leaf (Fig. 3), as a symbol of the winegrowing tradition, which is historically connected to the development of the village and current activities in the region.

Connection to the new trail will be possible from the north, west and east sides directly from the asphalt road. The total length of the route is 720 meters. The existing hiking trail is in the eastern part of the area (Fig. 3, white line). The adjacent area is relatively sloping, offers many views of the landscape, and an observation tower should also be located here (Fig. 4, red on the left). The proposed trail networks are designed from natural materials, also using recycled original materials available in the forest park. The educational function of the area is strengthened by presenting the attractions of the local biota and grouping recreational activities into functional zones (Figure 4, left).

The welcome zone is in the southern part of the area (Fig. 4, left, marked in blue), it is directly connected to the existing asphalt road. The main function is to provide parking for visitors, bicycle storage. The play zone (Fig. 4, left, marked in yellow) is located north of the welcome zone in a clearing in the middle of the forest. There are now many fallen trees, the wood of which can be used to make original play elements, mainly made of oak wood. Simple wooden structures forming play rings, a climbing frame and a climbing net are designed as play elements (Fig. 5). The play rings and the climbing frame serve to develop stability and coordination, while the climbing net is both a play and relaxation element. The production and viewing zone (Fig. 4, left, marked in burgundy) is located in the northwestern part of the area, it is bordered by an asphalt road. It is intended to provide users with not only beautiful views of the surrounding landscape and ancient oak trees, but also experiential education in the orchard. The design of the forest park recreational area includes measures supporting water retention in the landscape (Fig. 4, right), related to the preservation of seasonal water features and wetland zones.

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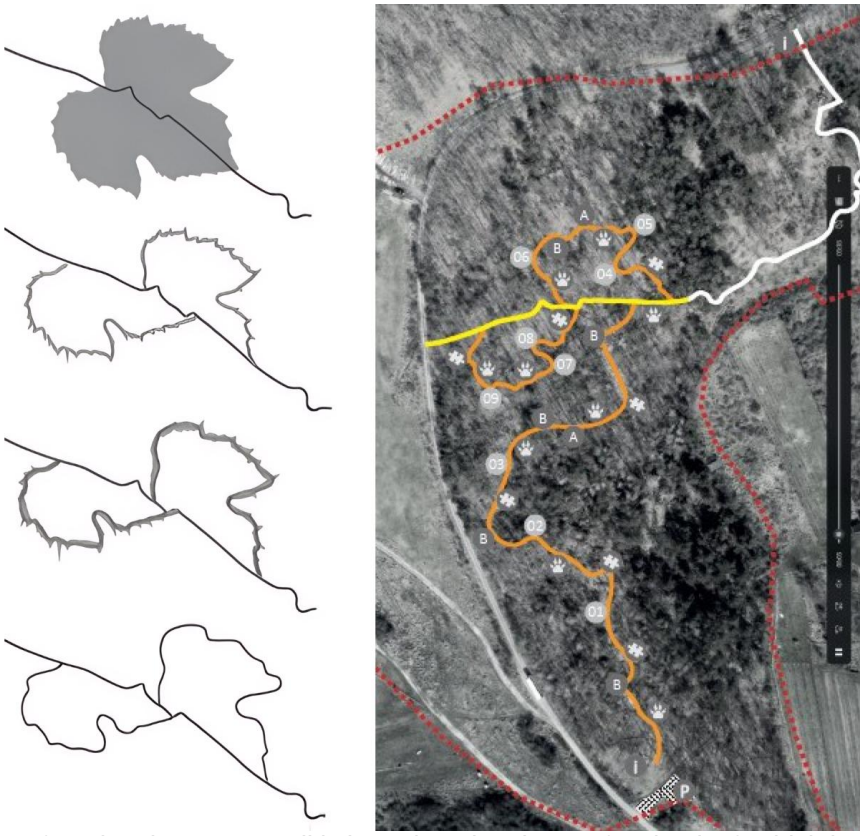

Fig. 3: The idea of tracing the nature trail is based on the shape of a vine leaf, which is shaped and incorporated into the current state of the area being addressed, see the genesis of the formation of the trail. (Kuczman, G., et al. 2024).

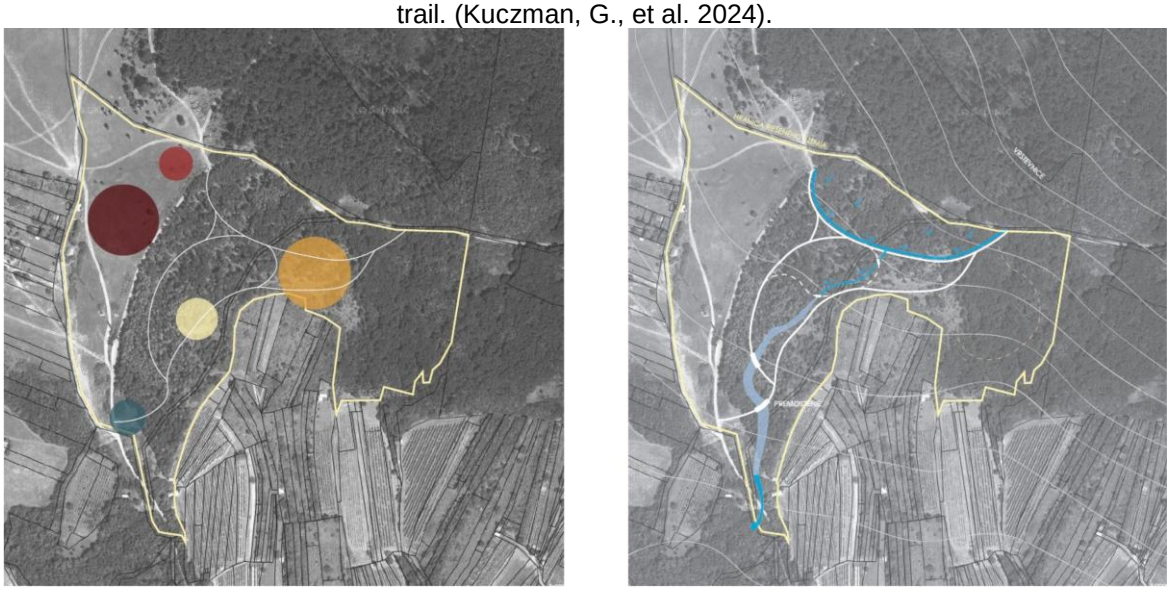

Fig. 4: Functional distribution of activities in the area of interest, marked trail routes, blue – entrance area, yellow – game zone, orange – recreation zone, red area – location of the observation tower, burgundy area marked as production- vineyards and fruit trees (Left). Proposed water retention measures with the proposed channel, indicated by arrows, extending towards the existing water feature (Kuczman, G., et al. 2024) (Right).

Discussion

In the design of the Rybník forest park, we worked with the idea of connecting recreational activities and environmental education. People's engagement in the environment is a process that needs to be developed over the long term in the form of various, qualitatively different and often informal events (James et al., 2010, Čibik et al., 2022). The findings of several studies indicate that youth need social support to develop environmental behavior in creating pro-environmental habits and a lifelong

relationship with nature (James et al., 2010; Kellert et al., 2017, Szczytko et al., 2020). Our common intention was to create recreational opportunities in the forest park for visitors of different age categories - families with children, school groups and the local community. We tried to incorporate a reference to the local viticulture and fruit growing tradition, views of the landscape and connect the forest park with the tourist and cycling routes of the region.

Conclusion

The proposed landscape and architectural solutions represent a possibility of revitalizing the Rybník forest park in the region, which is associated with the wine-growing tradition. The design of the forest park applied solutions close to nature - restoration of water features, support for water retention measures and the use of local natural materials for the restoration of communications, production of furniture, various play and educational elements. The revitalization of the forest park offers opportunities for recreation and experiential education in the region.

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Souhrn
Tato studie představuje krajinářsko-architektonický návrh lesoparku Rybník, který se nachází v blízkosti Chráněné krajinné oblasti Štiavnické vrchy. Lokalita se vyznačuje mírně svažitým terénem s malebnými vyhlídkami do okolní krajiny a kombinací volných ploch a lesních porostů. K jeho přednostem patří dobrá dostupnost pro pěší, cyklisty i návštěvníky motorovými vozidly. Cílem studie je využít potenciál lokality pro volnočasové aktivity návštěvníků všech věkových kategorií, podpořit environmentální povědomí a reflektovat místní tradice. Navržená řešení integrují do prostředí parku různé výtvarné prvky přírodního charakteru, aby se zvýšila jeho estetická hodnota a celková atraktivita. Cílem je vytvořit multifunkční prostor, který nabízí rozmanité možnosti odpočinku, rekreace a vzdělávání pro návštěvníky všech věkových skupin. Vzdělávací aspekt prostoru umožní dětem zapojit se do přírody zábavnou a interaktivní formou. Zavedení nových prvků a aktivit přispěje ke zlepšení kvality života v oblasti, posílení krajinného rázu a vytvoření atraktivního volnočasového prostoru pro návštěvníky. Návrhy designu jsou inspirovány místními přírodními prvky a také vinařskou a ovocnářskou tradicí regionu. Projekt, který představuje různá variantní řešení s důrazem na rekreaci, vznikl ve spolupráci se studenty Ústavu krajinářské architektury Slovenské zemědělské univerzity v Nitře pro Městské pozemkové společenství - Pozemkové společenstvo Rybník.

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