

RECREATION LAND USE IN TERMS OF WATER PROTECTION

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Abstract

The landscape has a wide range of uses. The current era encourages urbanism and rapid development of cities, but it is necessary to think and leave space for recreational use as well. The development of green spaces not only creates heat islands, but also degrades the recreational potential of the landscape. A vegetated environment is more pleasant to people than a concrete jungle. Water areas fulfil several functions, among which we can also include the recreational function. The use of water areas is also related to their protection. As more and more land is covered with impermeable surfaces, such as roads, buildings, and pavements, there is a reduction in the natural infiltration and percolation of rainwater into the soil. This results in increased surface runoff, which can cause flooding and erosion, and also leads to a decline in the groundwater recharge. Overall, the rapid pace of urbanization is taking a toll on the environment and its components. It is important to find ways to balance the need for development with the preservation of nature, in order to ensure a sustainable future.

Key words: Recreation use of water, sustainable environment, protection of water resources

Introduction

Recreational land use has become an increasingly important topic in recent years, especially when it comes to water protection. Water is a valuable resource that is essential for human survival and the environment, and it is crucial to ensure its protection and conservation. Recreation activities that take place on or near water bodies, such as swimming, boating, fishing, and other water-based activities, can have a significant impact on water quality and aquatic life. The growing population's increased need for food, shelter, and energy puts tremendous strain on water resources, particularly water quality. Globally, the growing urbanization and intensive agricultural operations are the main causes of the declining water quality (Giri, Qiu, 2016).

Therefore, it is essential to understand the relationship between recreational land use and water protection. This understanding can help identify best practices and guidelines for managing recreational activities near water bodies to ensure the sustainable use of water resources. To this end, a growing body of research has emerged, exploring the impacts of recreational activities on water quality and aquatic ecosystems, as well as strategies for mitigating these impacts. The three most significant human-caused changes to the land, including urbanization and agriculture, are emissions and emissions. Compared to rural areas, urban habitats have different bioclimatic characteristics. Urbanization modifies atmospheric and natural surface conditions. higher temperatures, decreased evaporation, and higher surface runoff of precipitation are characteristics of urban environments. The rural surface is warmed more than the urban surface by evaporation (Zelenakova et al, 2015).

The majority of people on earth now live in cities. The changes in land use and land cover brought about by this demographic shift have been shown to have a number of documented consequences on streamflows. The rise in impervious surfaces in urban watersheds, which changes the hydrology and geomorphology of streams, is the effect that is most constant. Along with imperviousness, runoff from urbanized surfaces and municipal and industrial discharges also contribute to increased flooding in urban areas by lowering river channels' flow capacities. Regarding environmental management and social criteria, stormwater management should be viewed as a sustainable strategy for the reconstruction of rural and urban areas (Junakova et al, 2020, 2021).

Characterisation of surface water body types

The subject of the study is the territory located in Bratislava, in the urban district of Ruzinov. The area is bounded by Mlynske Nivy, Hranicna and Bajkalska streets.

There are no natural or artificial water bodies in the area concerned. The closest to the area of interest is the gravel lake Ruzinov lake at a distance of about 700 m to the north and Strkovec lake about 1.3 km to the north. These are artificially created bodies of water, which, like most of the gravel lakes in

the territory of Bratislava, were created by gravel extraction in the past and after the end of the extraction the original extraction pit was left to be flooded with groundwater. At present, these gravel lakes serve a recreational purpose. The implementation of the project does not endanger the protection zones of these recreational water areas in any way.

The area of interest falls within the catchment area of the Little Danube. The area of interest is approximately 2 000 m from the source of the river. Following Table 1 represents basic characteristics about the Little Danube river.

Tab. 1: Basic characteristics about Danube catchment.

	Little Danube – source	Little Danube – estuary
Altitude	126 m	107 m
Coordinates	48°07'41"S 17°09'04"V	47°55'37"S 18°00'11"V
Geological composition	Fluvial sediments: lithofacies of unconsolidated alluvial clays or sandy to gravelly clays of valley and mountain stream valleys; Fluvial sediments: resedimented alluvial fine-grained sands; Fluvial-organic sediments: fine sandy, clayey to silty humic loams of dead channels and marshes; Fluvial sediments: alluvial floodplain fine sandy loams, fine – to medium-grained sands; Fluvial sediments: resedimented alluvial sandy gravels of the near-corizonta1 zone; anthropogenic sediments: spoil heaps, stockpiles and landfills (Geological map, 2023)	
Area	3 173 km ²	

Estimation of land use

The Broad Relationship Map (Figure 1) provides a comprehensive overview of the surrounding landscape and the location of the subject property within it. From this map, it is evident that the subject property is situated at the heart of a thriving built-up urban area that features numerous recreational areas, including urban green spaces. The map also indicates that there are no agricultural or industrial areas in the vicinity, which is a great advantage for those seeking a peaceful and serene living environment.

The abundance of recreational land use in the urban green spaces surrounding the subject property makes it an ideal location for outdoor enthusiasts and nature lovers. These green spaces offer a wide range of activities, including walking trails, cycling paths, playgrounds, and picnic areas, providing residents with a healthy and active lifestyle. Moreover, the green spaces also serve as a natural habitat for diverse wildlife, adding to the natural beauty of the surroundings.

The presence of a small park within walking distance of the subject property is an added advantage for those who value easy access to nature. This park could serve as a perfect spot for leisurely walks, reading, picnics, or even outdoor yoga sessions. It could also be an excellent place for parents to take their children for some outdoor playtime, where they can enjoy the fresh air and greenery.

Assessing the ecological status of Danube river

The basis for the assessment of ecological status is the biological quality elements – communities of aquatic organisms that reflect the synergistic effect of changes in the aquatic environment. Through the response of organisms to environmental change, the structure and functioning of their communities is altered. Biological quality elements include benthic invertebrates, phytobenthos and macrophytes, phytoplankton and fish. In the Danube River Basin Management Plan, 1282 surface water bodies with a total length of 16687.55 km were assessed in the period 2013-2018. Very good ecological status was found in 20 water bodies with a total length of 245.50 km. Good ecological status or good and better ecological potential was achieved in 486 water bodies in the reporting period, representing a length of 5486.26 km. The environmental objectives for ecological status/potential were achieved in 34.35 % of the total length of water bodies in the Danube River Basin Management Plan, corresponding to 506 water bodies. Average ecological status and average ecological potential were found in 653 water bodies with a length of 8998.32 km (53.92 % of the total length) (Ministry of the environment, 2020).

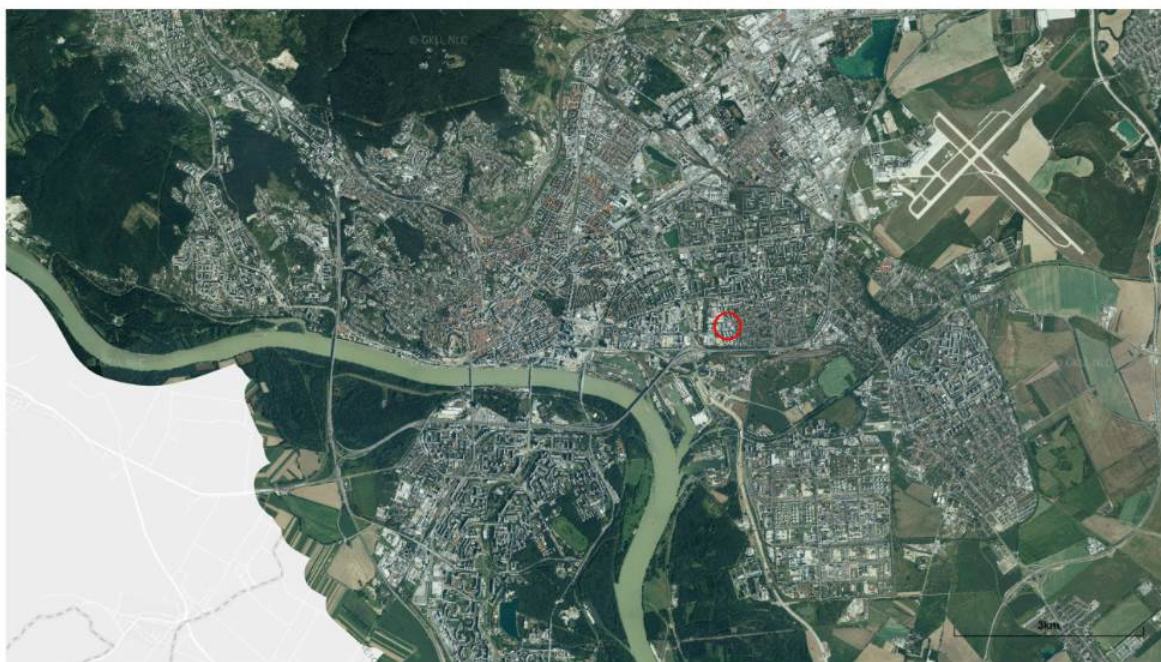


Fig. 5: The broad relationship map.

Conclusion

The subject of the study, located in the Ruzinov urban district of Bratislava, is a crucial part of the city's landscape. The area of interest is primarily used for residential and commercial purposes, making it essential to ensure that land use is adequately managed to avoid adverse effects on the environment. Land use activities, such as construction and development, can have severe implications for water protection, and it is vital to protect the area's land and water resources from harmful impacts.

To ensure water protection, it is essential to focus on preserving the quality of the water bodies within the catchment area of the Little Danube, which is critical for maintaining the ecological health of the region. The Little Danube's ecological status is a vital indicator of the water quality and must be monitored and improved over time. In this regard, the assessment of ecological status based on biological quality elements such as benthic invertebrates, phytobenthos, macrophytes, phytoplankton, and fish is critical.

Protecting the water resources in the area is vital not only for the ecological health of the region but also for the welfare of the community. The area's residents depend on water for various purposes, including drinking, cooking, and recreation. Therefore, it is essential to maintain the quality of the water resources by reducing pollution, managing wastewater, and preserving the natural environment.

In conclusion, ensuring proper land use and water protection is crucial for maintaining the ecological health of the area of interest in the Ruzinov urban district of Bratislava. To achieve this, it is crucial to focus on preserving the quality of the water bodies within the catchment area of the Little Danube, monitoring the ecological status of the region, and safeguarding the land and water resources from harmful impacts. By doing so, the area can continue to thrive sustainably, benefiting both the environment and the community.

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Souhrn

Předmět studie, který se nachází v bratislavské čtvrti Ružinov, je významnou součástí městské krajiny. Zájmové území je využíváno převážně k obytným a komerčním účelům, proto je nutné zajistit odpovídající management využití území, aby se předešlo nepříznivým dopadům na životní prostředí. Činnosti spojené s využíváním půdy, jako je výstavba a rozvoj, mohou mít významný vliv na ochranu vodních zdrojů, a proto je nezbytné chránit půdu a vodní zdroje v této oblasti před škodlivými vlivy.

Pro zajištění ochrany vod je nezbytné zaměřit se na udržení kvality vodních útvarů v povodí Malého Dunaje, která je zásadní pro zachování ekologického zdraví regionu. Ekologický stav Malého Dunaje je důležitým ukazatelem kvality vody a je třeba jej dlouhodobě sledovat a zlepšovat. V této souvislosti má zásadní význam hodnocení ekologického stavu na základě biologických prvků kvality, jako jsou bentičtí bezobratlí, fytoENTOS, makrofyta, fytoplankton a ryby.

Ochrana vodních zdrojů v této oblasti má zásadní význam nejen pro ekologické zdraví regionu, ale také pro blahobyt obyvatelstva. Obyvatelé oblasti jsou závislí na vodě pro různé účely, včetně pití, vaření a rekreace. Proto je nezbytné zachovat kvalitu vodních zdrojů snížením znečištění, nakládáním s odpadními vodami a ochranou přírodního prostředí.

Závěrem lze říci, že zajištění správného využívání území a ochrany vod je klíčem k zachování ekologického zdraví zájmového území městské části Bratislava Ružinov. Pro dosažení tohoto cíle je nutné zaměřit se na udržení kvality vodních útvarů v povodí Malého Dunaje, monitorování ekologického stavu území a ochranu půdy a vodních zdrojů před škodlivými vlivy. Tímto způsobem může oblast i nadále udržitelně prosperovat a přinášet prospěch životnímu prostředí i společnosti.

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