COMPLETING THE URBAN GREEN INFRASTRUCTURE WITH GREEN AREAS RELATED TO PUBLIC FACILITIES

POPESCU Oana-Cătălina, TACHE Antonio-Valentin, PETRIŞOR Alexandru-Ionuț

Abstract. The article analyses the contribution of urban public green spaces – gardens, parks, cemeteries – in biodiversity conservation, achieving ecological connectivity and the provision of important ecosystem services. The research focused on a specific component of green infrastructure, namely the green space in urban public cemeteries, which can bring and preserve biodiversity in urban areas. They can contribute to ecological networks in urban regions by achieving connectivity of habitats and can thus be included in the green belts of cities.

Keywords: urban green infrastructure, cemeteries, ecosystem services, ecological connectivity, biodiversity.

Rezumat. Completarea infrastructurii verzi urbane cu zonele verzi aferente facilităților publice. Articolul analizează contribuția spațiilor verzi publice – grădini, parcuri, cimitire – la conservarea biodiversității, realizarea conectivității ecologice și furnizarea unor importante servicii ecosistemice. Cercetarea se concentrează pe o componentă specifică a infrastructurii verzi, și anume spațiul verde din cimitirele publice urbane, cele care pot aduce și păstra biodiversitatea în orașe. Ele pot contribui la rețelele ecologice din regiunile urbane prin realizarea conectivității habitatelor și astfel pot fi incluse în centurile verzi ale orașelor.

Cuvinte cheie: infrastructură verde urbană, cimitire, servicii ecosistemice, conectivitate ecologică, biodiversitate.

INTRODUCTION

Green infrastructure can operate at the plot, regional or national level, and green space is the component of green infrastructure analysed at the local scale (POPESCU, 2022). Due to its spatial elements and the scales at which it can be applied, green infrastructure must be integrated into spatial planning processes at all levels.

Therapeutic gardens. One of the components of the urban green infrastructure are **the gardens**, seen as a space that combines the natural and the built environment. They were originally introduced as *therapeutic landscapes* by MILLIGAN et al. (2004) in their study of community gardens for older people in the North of England. It was then found that community gardening across different plots could have positive effects on older people physically, mentally and socially, providing relaxation, purpose, safety and inclusion (MILLIGAN et al., 2004). Later, it was shown that gardens are seen as a therapeutic landscape for other age groups as well, such as young people, and in general for the inhabitants of a city during the COVID-19 pandemic.

The theory of therapeutic landscapes is a conceptual framework for analysing places and environments that contribute to people's physical and mental health (THOMPSON et al., 2023). *Therapeutic landscapes* are best reflected by works of art and literature, in paintings and novels, illustrating the basic ideas of a society in a certain historical context (GESLER, 1992). In literature, *therapeutic landscapes* focus on blue and green spaces, but also on white and gray spaces, such as snow-capped mountains, snowscapes, beaches and deserts, stones and rocks – all evoking a wide variety of emotions (BROOKE & WILLIAMS, 2021).

Green areas related to public facilities: gardens, parks, cemeteries. According to the law in Romania (***. Parliament of Romania, 2009), the green spaces in the urban areas of localities also include those related to public facilities, which in turn include those of religious buildings and cemeteries

Cemeteries and churchyards are a component of the green infrastructure typology, along with parks and gardens, landscaped green spaces, natural and semi-natural green spaces and green corridors (NATURAL ENGLAND, 2009; MELL, 2016) (mentioned under "others", together with allotments, community gardens and urban farms). On an urban scale, the typology proposed by the European Commission (***. EC and EEA, 2021) includes cemeteries and churchyards in the category of *urban parks and (semi)natural green areas*, including urban forests – which bring biodiversity to urban areas and provide spaces of recreation for residents (along with large urban parks, historical gardens, smaller parks, botanical gardens, zoos, neighbourhood green spaces, forests, abandoned green areas, abandoned areas with traces of wilderness, green sports facilities).

Garden cemeteries. Garden cemeteries were among the first public parks in the United States in the early 19th century, with carefully designed green spaces and walkways with pleasant landscaping and sculptures. The Garden Cemeteries inspired the introduction of modern urban parks and, although they were replaced by more common and less decorated ones, they still survive today. Although originally located on the outskirts of cities, close to transport corridors, cemeteries have been integrated into the urban fabric with urban expansion. Urban cemeteries are usually smaller than forests or urban parks and represent a green space that in the future will become more and more important for climate regulation.

Europe still includes urban cemeteries of the garden or park type (NATIONAL GEOGRAPHIC, 2019) that attract local visitors or tourists and have become recognized attractions. They were designed by architects who connected them to the history and culture of their countries – for example Mirogoj Cemetery, Zagreb, Croatia, designed by architect Hermann Bollé. Some park-like urban cemeteries are in a forest landscape – for example, the Hietaniemi Cemetery in

Helsinki, Finland. Others are in a picturesque setting – such as the Hólavallagarður Cemetery (in Reykjavik, Iceland), which overlooks Marsamxett Harbor on the edge of the city, or Prazeres Cemetery (in Lisbon, Portugal). The numerous species of trees form forested areas in the cities where they are located, and large green areas are filled with exotic species of trees and birds – such as in the Msida Cemetery (or Msida Bastion Garden), in La Valletta, Malta, with ivy-covered walls or with endangered moss species.

Contributing to ecological connectivity. Biodiversity loss increases the risk of species extinction and leads to the loss of ecosystem services. One of the most popular approaches to maintaining populations and conserving biodiversity in fragmented landscapes is to preserve or create corridors that connect otherwise isolated habitat patches/areas. Corridors can redirect the movements of different species, with more extensive movement between connected patches. Increasing the permeability of the landscape or establishing new habitats and corridors can improve the connectivity of remaining natural habitats as smaller and smaller patches (BARANYI et al., 2011). According to the principles of landscape ecology, a patch is an area of habitat that differs from its surroundings (e.g., wetlands, grasslands). The patches, which are of focal interest for the study of ecological phenomena, are surrounded by matrices, which can greatly influence ecological processes in the landscape (NATURE, 2010). Corridors, which are narrow patches that can function as links or barriers in a landscape, are functionally important landscape structures that influence the dispersal of plants and animals (HADDAD et al., 2003). The implementation of ecological corridors in current planning practice must be completed cautiously, since economic activities may be subjected to specific restrictions (POPESCU et al., 2022).

On the regional level, not only garden networks can provide ecological connectivity, but green space in cemeteries can also contribute to ecological networks within and adjacent to urban regions (GODDARD et al., 2012). Cemeteries are practically links between urban green areas and ecological corridors; they are part of possible ecological corridors or stepping stones for gene flow in mammal populations between city parks in a heavily urbanized area (SAEUMEL et al., 2023).

In the urban environment, the importance of habitat connectivity has been demonstrated, as achieving ecological connectivity by linking habitats and ecological processes is a measure meant to bring fragmented environments together. That is why recent studies have proposed that green cemeteries should be implemented as an alternative use along ecological corridors and green belts to form a continuous sustainable park (MCCLYMONT & SINNETT, 2021). Furthermore, the idea of a "common green belt" has been suggested to combine the need for connectivity with land occupation by cemeteries, resulting in ecological corridors with multiple, but flexible uses and services.

MATERIALS AND METHODS

The subject of this research is a special type of green infrastructure, namely the urban cemeteries. They have a big potential not only to preserve habitats in cities and offer important ecosystem services, but also to be included in ecological corridors and in green belts of cities. For this, we have analysed scientific literature in connection with the accessibility and interest of inhabitants to visit the green spaces of cities, and related to the increasing possible role of urban cemeteries to be considered an important part of their green infrastructure. The study is part of a larger research focused on the green belt of the city of Bucharest.

RESULTS

The results of the research show that green spaces in urban cemeteries provide important ecosystem services, among which we emphasize those of recreation (cultural services) and conservation of biodiversity and habitat. This is due to their great potential to complement urban green infrastructure (Table 1). Like parks, cemeteries are an important component of green infrastructure networks, having all their characteristics: they are included in the typology of green infrastructure, they provide ecosystem services (cultural, regulatory and maintenance services related to the improvement of health and well-being, flood risk management, of soil, water, air quality, pollination and climate adaptation) and bring similar benefits to green infrastructure – recreation and nature conservation (Fig. 1). Moreover, in addition to their classic role as a sacred area, urban cemeteries can be genuine open-air museums, parks containing important habitats of the city, sometimes even reserves of flora and fauna. Besides these, they also have an important social role.

The role of recreation (cultural services). The concept of recreational use of cemeteries is relatively new. Some research shows that visitors to urban cemeteries also appreciate the trees here, especially for shade, aesthetics, and a sense of personal and place well-being (QUINTON et al., 2019). Walls, hedges, ditches and other boundary structures of cemeteries serve primarily to create atmosphere (SAEUMEL et al., 2023).

The conclusions of some studies dedicated to the perception of visitors in a green space such as cemeteries (HUANG, 2007) showed that people have a **moderate** interest in performing traditional recreational activities in organized public cemeteries, namely – in the following order – for: educational, leisure, sports and artistic activities. Regarding people's attitudes, it is argued that they can have beneficial and emotional attributes.

Table 1. Main results of the research.

Results	Authors
There is great potential for public cemeteries to complement urban green infrastructure	(MCCLYMONT & SINNETT, 2021; JAGANMOHAN et al., 2018, QUINTON et al., 2019; DŁUGOZIMA & KOSIACKA-BECK, 2020; GRABALOV & NORDH 2022).
Numerous studies have recommended that green spaces in urban cemeteries can help mitigate the effects of climate change.	(DŁUGOZIMA & KOSIACKA-BECK, 2020; QUINTON & DUINKER, 2019; (KOWARIK et al., 2016).
Green spaces in cemeteries should be managed and researched as urban green spaces that provide numerous ecosystem services	(QUINTON & DUINKER, 2019).
The role of cemeteries in a multifunctional network of green infrastructure has not yet been studied and planning policy does not explicitly express their role as green infrastructure	(MCCLYMONT & SINNETT, 2021).
Although trees are a valued component of the landscape in an urban cemetery, to date this value has been relatively unexplored and undocumented	(QUINTON et al., 2019).
Cemeteries are often located in densely populated areas or on their outskirts and are a good example of peripheral land use	(NIȚĂ et al., 2014)
In arid regions, cemeteries are less vegetated and have less pressure from visitors, positively influencing species richness	(KOWARIK et al., 2016).

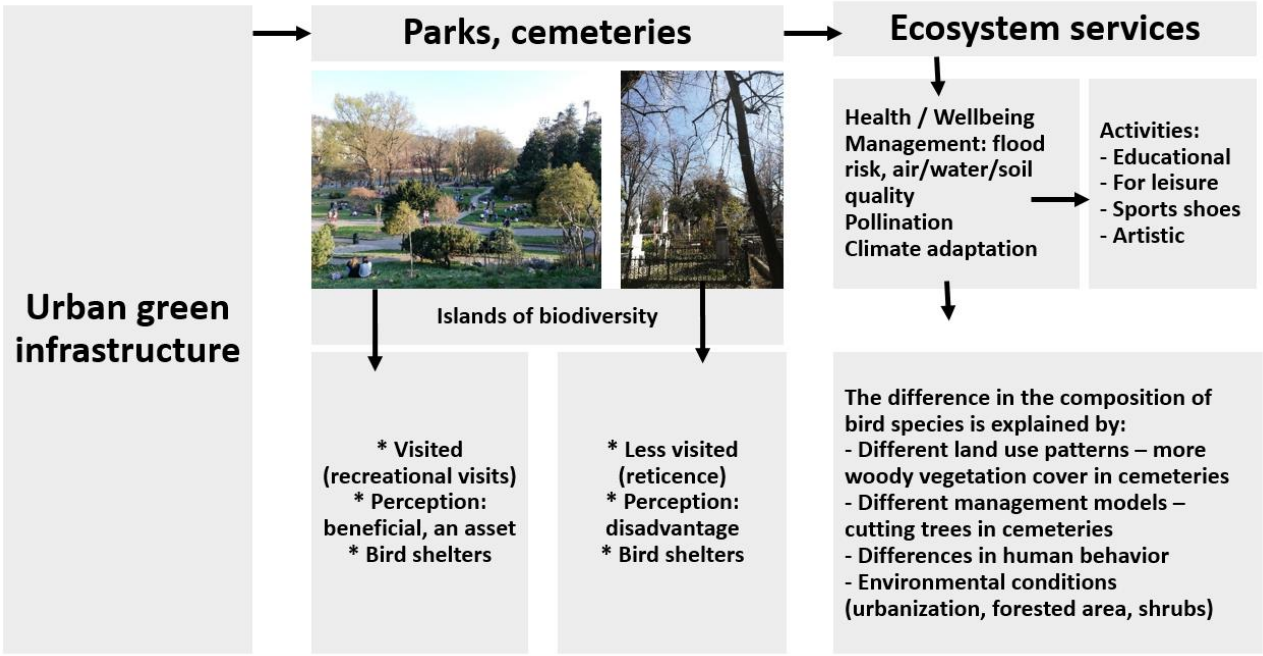

Figure 1. Urban green infrastructure: ecosystem services offered by parks and cemeteries.

The role of biodiversity and habitat conservation. Cultural landscapes (those influenced by humans) are generally considered to contain a great diversity of plants and animals, and cemeteries are such repositories of natural and cultural capital. (BARRETT & BARRETT, 2001). Unlike other green spaces in cities, cemeteries are **culturally** protected sacred places. Interest in such a place is largely limited to a particular city (STRAKA, 2022), and usually such an element of green infrastructure is embedded in local history and developed during periods of rapid urban growth (RUGG, 2000). In addition to their historical value, the old urban cemeteries also have a botanical and horticultural one. From both points of view – cultural and natural – they have a great conservation potential: indigenous, exotic, rare species are preserved here (MCBARRON et al., 1988).

Although rich in vegetation, urban cemeteries are often not analysed as green spaces, especially because, unlike other types of urban green space, cemeteries are characterized by a stable, long-lasting habitat, greater isolation and a lower frequency of use and disruption. In addition to parks, cemeteries offer a sense of calm and seclusion that many parks do not.

Cemeteries are considered islands of biodiversity in urban ecosystems, refuges for birds. Not all species have the same tolerance for urban life – in general, urbanization puts species at risk – and birds are a way of assessing environmental changes in urban areas (TRYJANOWSKI et al., 2017). In the green areas of cemeteries, especially bird species that do not agree with the effects of urbanization on the environment – such as the urban heat island effect – and the associated risks – such as the risk of collision with buildings and cars, predators or diseases –, find their habitat. At the same time, researches have shown that, in cemeteries, as in parks, the abundance of species is determined by the number and age of the trees that were there.

DISCUSSION

The need to integrate cemeteries into the park system. Although not regarded in the same way as public parks – in Central and Eastern Europe cemeteries are used for recreational purposes, but are much less visited than parks (TRYJANOWSKI et al., 2017) – urban cemeteries have great potential to provide numerous recreational benefits to visitors and residents of a city. Such a green space, especially if it is landscaped and maintained, can be a point of attraction for residents and tourists, offering numerous advantages. The choice of such a recreational action largely depends on the perception people have of such a place. As research has shown that the intention to carry out a recreational activity in an urban cemetery is moderate, this is explained by the fact that people do not consider them to be public parks, and also due to the lack of development projects for these green spaces. Moreover, in the real estate market, if proximity to a park is perceived as an asset, proximity to a cemetery is considered a disadvantage.

Many times, some countries consider that public cemeteries are also integrated into their **park system**, especially since in many countries they have become tourist sites, elements of their built heritage. But in addition to the special constructions here, their natural potential must also be taken into account, because they often host species of plants and animals that usually do not find a place in the crowded city. For example, the Woodland Cemetery in Stockholm, Sweden, which is located in a beautiful forest landscape and has been on the UNESCO list of cultural and natural heritage since 1994 (Fig. 2).

Figure 2. The Skogskyrkogården Woodland Cemetery, inscribed on the UNESCO World Heritage List in 1994 (1459, 1600, 1700, 1831) (By Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=3077465).

Specific biodiversity. Less human activity in green spaces in cemeteries, the absence of pets compared to a typical park, the cutting of trees for public safety reasons, the pattern of land use, the greater cover of woody vegetation and the presence of certain tree species determine the predominant existence of certain species in this type of green infrastructure. A comparative study of biodiversity patterns in public parks and public cemeteries in 3 Central European Countries (TRYJANOWSKI et al., 2017) showed the greater presence of certain birds in green spaces in cemeteries, negatively affected by urbanization and favoured by the presence of wooded areas and shrubs, by a greater cover of woody vegetation, or due to rock structures in cemeteries, such as *Dryobates minor* L. (lesser spotted woodpecker), *Phoenicurus phoenicurus* L. (common redstart, which is also found in the Père Lachaise Cemetery in Paris), or *Columba palumbus* L. (common wood pigeon).

Birds that prefer certain species of trees and shrubs have been found in the parks, such as *Leiopicus medius* L. (middle spotted woodpecker, which prefer mature oaks), owls like *Strix aluco* L. (tawny owl) and *Athene noctua* Scopoli (little owl), which prefer old trees with cavities, *Sylvia atricapilla* L. (Eurasian blackcap), *Luscinia luscinia* L. (thrush nightingale), *Coccothraustes coccothraustes* L. (hawfinch, that prefers fruit trees), or species fed by humans – *Columba livia* Gmelin (rock dove).

Urban cemeteries are also habitats for plants, and there is a great conservation interest for some of them, especially in the case of those favoured by the wilder parts of cemeteries (KOWARIK et al., 2016). Ivy generally predominates here (*Hedera helix* L.), proving to have a negative impact on plant diversity. In the older, wooded cemeteries, there are typical forest species such as common fern (*Dryopteris filix-mas* L. – male fern), in contrast to younger cemeteries, with trees that have less decayed wood, where there are species more resistant to environmental factors (eurytopic) such as birch (*Betula pendula* Roth). As for insects, wooded cemeteries host carabid species (ground beetles) such as *Carabus nemoralis* Müller – wood ground-beetle, insects, and spiders.

Partially or fully abandoned cemeteries can bring wilderness points into the urban area (KOWARIK et al., 2016). There are studies that show that the landscape around cemeteries – the development of residential areas or the increase in the density of roads – determines the reduction of their vegetation cover and implicitly the abundance of native species.

Although cemeteries are part of the urban green space and urban green infrastructure, they are not strategically managed from this point of view, as they are managed by different organizations (public/private) and considerations. This makes them difficult to integrate into the networks of urban habitats – parks and other green spaces – that are the subject of planning activities.

CONCLUSIONS

Green spaces inside cemeteries can ensure the movement of wild species in the landscape, because many organisms (animals, seeds, and spores) require movement within or between habitat areas and this can be ensured by the connectivity of the landscape in which these places are located. At an appropriate scale, cemeteries can be thought of as habitat patches, discrete patches of habitat through which connectivity can be achieved based on movement between them. This connectivity is achieved between different points/locations of a landscape, which may belong to the same habitat area (the cemetery itself) or in different areas (connectivity between patches). Some authors (SPANOWICZ & JAEGER, 2019) consider that the amount of habitat is also very important from a biological point of view.

In denser cities whose residents have less access to public green space, cemeteries are increasingly used, which underlines the need for strategies to promote their recreational use. That is why the governors should bring physical improvements, provide convenient access to them, and greater media visibility, which will change people's perception towards landscaped public cemeteries.

Since cemeteries are a collection of natural and cultural elements, an enhancement of their role as an urban green space should be approached holistically, that is, taking into account the protection of nature and cultural heritage. So:

The design must combine the provision of good access while preserving sections with more wild habitats. Planning is needed for the transformation of cemeteries into parks / public gardens. This transformation is also necessary because, nowadays, green spaces in cities are increasingly less and more damaged, due to anthropogenic and natural causes. From the point of view of design and management, different interventions can be proposed in different sections of the cemeteries, which allow a certain degree of wilderness to be preserved (and visitors should be informed about the ecological values here), with the provision of access through well-maintained paths and lanes.

For **the conservation of biodiversity**, some ecological measures must be taken into account in terms of plant cover, which will lead to the growth and improvement of the tree population, the control of the vegetation cover, the increase of the heterogeneity of the habitat. Usually, most of the trees are old, and their possible disappearance requires the planting of new trees and regeneration. Some cities host old cemeteries, where populations of rare species have been maintained, and therefore excessive cleaning should be avoided. The heterogeneity of the habitat should be increased, in the sense of achieving an alternation of more open parts of the cemetery (through trees with a suitable canopy) with wilder parts (but with good access through paths and alleys). In order to preserve the biological and cultural values, the colonization of the built structures by plants and animals is recommended. From the point of view of preserving biodiversity, the structures necessary for the habitats of forest species should be preserved (scurfs for example), but those that could be a danger to visitors (dead wood) should be removed. To promote plant diversity, it is recommended to control (reduce / allow) areas covered with ivy (*Hedera helix* L.), with forest (e.g. with maple – *Acer*), and the re-vegetation of built structures (walls, tombs), on a case-by-case basis.

Through the multiple ecosystem services they provide, this type of infrastructure (urban cemeteries) can be included in a green or green/blue corridor that will link several fragmented green points in the city, even smaller in size, and allow the movement of species of animals, which might otherwise remain isolated. Thus, urban cemeteries can be considered habitat patches (patches) or even stepping stones between city parks, parts of an ecological corridor that has complex uses. Green spaces in cemeteries located on the urban periphery can help ensure ecological connectivity and can be successfully included in a green belt.

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REFERENCES

BARANYI G., SAURA S., PODANI, J., JORDÁN F. 2011. Contribution of habitat patches to network connectivity: Redundancy and uniqueness of topological indices. *Ecological Indicators*. Elsevier. Paris. **11**(5): 1301-1310.

BARRETT G. W. & BARRETT T. L. 2001. Cemeteries as repositories of natural and cultural diversity. *Conservation Biology*. Wiley Press. London. **15**(6): 1820-1824.

BROOKE K. & WILLIAMS A. 2021. Iceland as a therapeutic landscape: White wilderness spaces for well-being. *GeoJournal*. Springer. Berlin. **86**(3): 1275-1285.

DŁUGOZIMA A. & KOSIACKA-BECK E. 2020. How to enhance the environmental values of contemporary cemeteries in an urban context. *Sustainability*. MDPI Press. London. **12**(6): 2374.

GESLER W. M. 1992. Therapeutic landscapes: Medical issues in light of the new cultural geography. *Social Science and Medicine*. Elsevier. Paris. **34**(7): 735-746.

GODDARD M. A., DOUGILL A. J., BENTON T. G. 2010. Scaling up from gardens: biodiversity conservation in urban environments. *Trends in ecology & evolution*. Scimago Press. London. **25**(2): 90-98.

GRABALOV P. & NORDH H. 2022. The future of urban cemeteries as public spaces: Insights from Oslo and Copenhagen. *Planning Theory & Practice*. Taylor & Francis Press. London. **23**(1): 81-98.

HADDAD N. M., BOWNE D. R., CUNNINGHAM A., DANIELSON B. J., LEVEY D. J., SARGENT S., SPIRA T. 2003. Corridor use by diverse taxa. *Ecology*. The Ecological Society of America Press. New York. **84**(3): 609-615.

HUANG S. C. L. 2007. Intentions for the recreational use of public landscaped cemeteries in Taiwan. *Landscape Research*. Taylor & Francis Press. London. **32**(2): 207-223.

JAGANMOHAN M., VAILSHERY L. S., MUNDOLI S., NAGENDRA H. 2018. Biodiversity in sacred urban spaces of Bengaluru, India. *Urban Forestry & Urban Greening*. Scimago Press. London. **32:** 64-70.

KOWARIK I., BUCHHOLZ S., VON DER LIPPE M., SEITZ B. 2016. Biodiversity functions of urban cemeteries: Evidence from one of the largest Jewish cemeteries in Europe. *Urban Forestry & Urban Greening*. Scimago Press. London. **19**: 68-78.

MCBARRON E. J., BENSON D. H., DOHERTY M. D. 1988. The botany of old cemeteries. *Cunninghamia*. Science Press. Tokyo. **2**(1): 97-105.

MCCLYMONT K. & SINNETT D. 2021. Planning cemeteries: Their potential contribution to green infrastructure and ecosystem services. *Frontiers in Sustainable Cities*. Scimago Press. London. **3**: 789925.

MELL I. 2016. Global green infrastructure: lessons for successful policy-making, investment and management. *Routledge*. Taylor & Francis Press. London: 15-23.

MILLIGAN C., GATRELL A., BINGLEY A. 2004. 'Cultivating health': therapeutic landscapes and older people in northern England. *Social science & medicine*. Elsevier. Paris. **58**(9): 1781-1793.

NIȚĂ M. R., IOJĂ I. C., ROZYLOWICZ L., ONOSE D. A., TUDOR A. C. 2014. Land use consequences of the evolution of cemeteries in the Bucharest Metropolitan Area. *Journal of Environmental Planning and Management*. Scimago Press. London. **57**(7): 1066-1082.

POPESCU OANA-CĂTĂLINA. 2022. *Concepte și instrumente ecologice în planificarea teritorială. Studiu de caz: conectivitatea infrastructurilor verzi*, Teză de doctorat. București. 150 pp.

POPESCU OANA-CĂTĂLINA, TACHE A.-V., PETRIȘOR A.-I. 2022. Methodology for identifying ecological corridors: a spatial planning perspective. *Land*. MDPI Press. London. **11**(7): 1013.

QUINTON J. M., DUINKER P. N., GALLANT K. A., STEENBERG J. W., CHARLES J. D. 2019. To tree or not to tree: User and management perspectives of cemetery trees. *Urban forestry & urban greening*. Scimago Press. London. **43**: 126385.

QUINTON J. M. & DUINKER P. N. 2019. Beyond burial: Researching and managing cemeteries as urban green spaces, with examples from Canada. *Environmental reviews*. Scimago Press. London. **27**(2): 252-262.

RUGG J. 2000. Defining the place of burial: what makes a cemetery a cemetery? *Mortality*. National Cancer Institute Press. London. **5**(3): 259-275.

SAEUMEL I., BUTENSCHOEN S., KREIBIG N. 2023. Gardens of life: Multifunctional and ecosystem services of urban cemeteries in Central Europe and beyond - Historical, structural, planning, nature and heritage conservation aspects. *Frontiers in Environmental Science*. Springer. Berlin. **10**: 1077565.

SPANOWICZ A. G. & JAEGER J. A. 2019. Measuring landscape connectivity: On the importance of within-patch connectivity. *Landscape Ecology*. Springer. Berlin. **34**: 2261-2278.

STRAKA T. M., MISCHO M., PETRICK K. J., KOWARIK I. 2022. Urban cemeteries as shared habitats for people and nature: Reasons for visit, comforting experiences of nature, and preferences for cultural and natural features. *Land*. MDPI Press. London. **11**(8): 1237.

THOMPSON J., HOWARTH M., HARDMAN M., COOK P. 2023. Cultivated Therapeutic Landscapes: Gardening for Prevention, Restoration, and Equity. *Routledge*. Taylor and Francis Inc. London: 133-152.

TRYJANOWSKI P., MORELLI F., MIKULA P., KRIŠTÍN A., INDYKIEWICZ P., GRZYWACZEWSKI G.., JERZAK L. 2017. Bird diversity in urban green space: A large-scale analysis of differences between parks and cemeteries in Central Europe. *Urban Forestry & Urban Greening*. Scimago Press. London. **27**: 264-271.

***. EC and EEA. 2021. *Biodiversity Information System for Europe*. [Online], Retrieved from: https://biodiversity.europa.eu/green-infrastructure/typology-of-gi (accessed March, 2024).

***. NATIONAL GEOGRAPHIC. 2019. Garden cemeteries were among America's first urban parks, [Online], Retrieved from: https://www.nationalgeographic.com/travel/article/best-garden-cemeteries (accessed March, 2024).

***. NATURAL ENGLAND. 2009. *Green Infrastructure Guidance*, NE176*,* [Online], Retrieved from: http://publications.naturalengland.org.uk/publication/35033 (accessed March, 2024).

***. NATURE. 2010. *Principles of landscape ecology,* [Online], Retrieved from: https://www.nature.com/scitable/knowledge/library/principles-of-landscape-ecology-13260702/ (accessed March, 2024).

***. PARLIAMENT OF ROMANIA. 2009. "Law no. 24 of 15 January 2007 (republished) on regulating and administering green spaces within human settlements" *Official Gazette*. **764** (accessed March, 2024).

Popescu Oana-Cătălina
National Institute for Research and Development in Constructions, Urbanism and Sustainable Spatial Development URBAN-INCERC, Şos. Pantelimon, nr. 266, sector 2, cod 021652, Bucharest, Romania.
National Institute for Research and Development in Tourism, Str. Apolodor, nr. 17, sector 5, cod 050741, Bucharest, Romania.
E-mail: oana_katalina2006@yahoo.com

Tache Antonio-Valentin
National Institute for Research and Development in Constructions, Urbanism and Sustainable Spatial Development URBAN-INCERC, Şos. Pantelimon, nr. 266, sector 2, cod 021652, Bucharest, Romania.
National Institute for Research and Development in Tourism, Str. Apolodor, nr. 17, sector 5, cod 050741, Bucharest, Romania.
E-mail: tonytache62@gmail. com

Petrişor Alexandru-Ionuţ
Doctoral School of Urban Planning, "Ion Mincu" University of Architecture and Urbanism, Str. Academiei, nr. 18-20, sector 1, cod 010014, Bucharest, Romania.
Technical University of Moldova, Faculty of Urbanism and Architecture, Department of Architecture, bd. Dacia, nr. 39 (blocul de studii nr. 9), cod 2004, Chisinau, Moldova.
National Institute for Research and Development in Constructions, Urbanism and Sustainable Spatial Development URBAN-INCERC, Şos. Pantelimon, nr. 266, sector 2, cod 021652, Bucharest, Romania.
National Institute for Research and Development in Tourism, Str. Apolodor, nr. 17, sector 5, cod 050741, Bucharest, Romania.
E-mail: alexandru_petrisor@yahoo.com, Internet: http://www.environmetrics.ro

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