

Regional and landscape conservation of Ukraine's historical parks

Serhii Popovych, Olha Zibtseva*

¹ Landscape Architecture and Phytodesign Department, National University of Life and Environmental Sciences of Ukraine, Kyiv, 03041, Ukraine

*Corresponding author e-mail: stplut2017@gmail.com

Received: 19 January 2026 / Accepted: 12 May 2026

Abstract. With the passage of time, the understanding of ancient phenomena of nature and culture becomes more relevant. The purpose of the article is to analyze the modern network of ancient protected parks in Ukraine, which are over 100 years old. The modern network is represented by eight botanical gardens, 11 dendrological parks, three zoological parks, and 68 Park Monuments of Landscape Architecture. The density of park distribution varies according to the physico-geographical zones and mountainous regions of Ukraine. Four objects are represented in the mixed forest zone, 21 in the broad-leaved forest zone, 38 in the forest-steppe zone, nine in the steppe zone, seven in the Carpathian mountainous region, and 10 in the Crimean mountainous region. Among the 27 administrative regions, the Autonomous Republic of Crimea leads in terms of quantity and area. The total area of the objects is 1152.80 ha. The diversity of landscapes in the Forest-Steppe and broad-leaved forest zones proved to be the most optimal for ancient park construction. The landscape organization of park territories is modeled by polyfunctional zoning, which is eco-balanced in terms of the distribution of natural and cultural values, eco-conditions, management elements, and conservation regimes. Given the importance of each functional zone and sub-zone, guidelines for their areas are recommended. The strict protection zone should make 10-15% of the total park area, the scientific zone 15-25%, the administrative and economic zone - 5%, and the exhibition zone - 75-50%. A system of architectural and planning organization techniques and conservation regimes.

Keywords: conservation, location, regimes, botanical gardens, dendrological parks, park monuments of landscape architecture.

1. Introduction

An important indicator of the general culture and morals of any society is its attitude towards the environment, the level of care for the preservation of nature, and the restoration of its resources. The first parks appeared in ancient times when more or less defined state societies were formed. Initially, private parks were founded, which later transformed into public spaces

(Yoon & Kwon, 2010). Currently, most ancient parks are considered both natural and cultural heritage and have a nature conservation status.

The development of landscape architecture and territorial nature protection are closely related and share common historical milestones. In the relationship between these two sides, concerns are growing regarding careless intervention or excessive reconstruction of natural heritage landscapes, as the degree of native landscape authenticity is an important indicator of park visitors' loyalty (Buckwell et al., 2024; Cheng et al., 2025). Attention is also focused on potential threats to plants in ancient parks from ecotic, biotic, and anthropocentric factors. Strategies for counteracting threats are emerging (Carrari et al., 2022). The Florence Charter revived the relevance of preserving ancient parks (Jagiello, 2021). Therefore, there is a need to harmonize heritage preservation with future sustainability by integrating heritage protection and management into local blue-green infrastructure planning (Zhou & Zhai, 2026).

Research on park heritage in different countries around the world is gaining increasing relevance (Kim et al., 2022; Silva et al., 2022; Li et al., 2024; Bello & Batch, 2025). Among the rich palette of themes, the polemic about the essence of heritage content is central. Heritage is usually interpreted as encompassing the collective tangible and intangible value of societies passed down from generation to generation (Sharma et al., 2025).

Special attention is required for ancient UNESCO World Heritage sites of global significance as crucial landmarks of human efforts in nature and culture protection for eco-balanced development. Currently, the content of these objects has expanded, covering a wider range of landscape meanings (Chen et al., 2023; Xu et al., 2024; Lian et al., 2025).

The concept of a historic garden (park in a broader sense), whose definition is still debated, is no less significant in science. Most often, parks aged around or over 100 years are included in this category. The term "historic garden" demonstrates a stronger connection with the term "preservation" and "restoration". This is evidenced by modern research, which primarily focuses on the preservation of garden heritage based on historical methods (Hosseini & Caneva, 2022). The Florence Charter (1981) defined the historic garden as an important category of cultural heritage, which is identified as a dynamic living system (Gothein, 2014), as an "architectural and horticultural composition of public interest from a historical or artistic point of view," i.e., a combined system of a living plant component and architectural or sculptural elements (Carrari et al., 2024). The role of historical parks as a synthesis of cultural and natural heritage is increasingly critical in the face of modern environmental threats and urbanization pressures (Zachariasz, 2021). Historical manor parks is a significant asset for the

sustainable development of local communities, provided that effective management models are applied (Rosłon-Szeryńska et al., 2020).

Ancient parks of Ukraine represent a significant component of the state's cultural and natural heritage of international, national, and regional significance. Since the end of the 19th century, their value has attracted the attention of many researchers in various fields. The most valuable ancient parks, as a unique national heritage, are singled out from the rich variety of landscape architecture territories in this article. Undoubtedly, Ukrainian historical parks hold international significance, as they intertwine the motifs of various nations within the context of the development of not only nature conservation but also architecture, ethnography, culture, art, public administration, and ultimately, politics. These parks are currently part of the Nature Reserve Fund (NRF) of Ukraine. The purpose of the study was a comprehensive analysis of the network of ancient protected parks in Ukraine for the further development of recommendations for their eco-balanced territorial organization on a landscape basis. For this, the composition of objects, and the regional features of their network were traced. The polyfunctional landscape organization of territories based on the principles of eco-balanced development and the system of conservation, restoration, and rational use regimes were also studied.

The idea behind writing this article is the necessity to convey information about park heritage of Ukraine to the global scientific community. The object of research was the network of ancient parks in Ukraine aged 100 years and older: modern composition, regional distribution of objects with the identification of historical centers depending on physico-geographical conditions, park affinity.

2. Materials and methods

The research material consisted of scattered and fragmented data on ancient parks in Ukraine. Specialized historical parks were considered, which include Botanical Gardens (BG), Dendrological Parks (DP), Zoological Parks (ZP), Park Monuments of Landscape Architecture (PMLA). A total of 90 historical parks in Ukraine were analyzed. Part of the information was taken from a series of works by S. Yu. Popovych on regional NRF networks (Popovych, 2012; 2016; Popovych & Vlasenko, 2019). The main statistical materials were taken from the official pre-war reports of the former Ministry of Environmental Protection of Ukraine (Information and analytical materials..., 2021), the State Cadastre of Territories and Objects of the Nature Reserve Fund of Ukraine (State Cadastre of Territories..., 2013), the Atlas of Objects of the Nature Reserve Fund of Ukraine and its appendix (Leonenko et al., 2003), and reference,

registry, cadastral, and internet information sources (Statistical data of the Ministry of Ecology..., 2019). Materials from the authors' field research over the last 45 years were also included.

The main general scientific method was the system approach, which included bibliographic search; analytical synthesis; comparative evaluation. Among the special research methods, the inventory method (Popovych & Vlasenko, 2019) was applied. This approach involved compiling an annotated list of local ancient parks, alongside an analysis of their distribution patterns. After compiling the nationwide list of parks, objects were selected considering the boundaries of physico-geographical zones and mountainous regions (Marynych et al., 2003) and administrative regions of Ukraine. The areas of the parks were clarified according to the directory (Leonenko et al., 2003) and the electronic cadastre databases of the NRF of the Ministry of Environmental Protection of Ukraine (Information and analytical materials...,2021).

Data analysis on the distribution of objects by administrative region was performed using cluster and factor analysis within the STATISTICA 12 software package.

The methodological basis for the territorial organization of ancient park conservation is the application of the landscape approach (Funsten et al., 2020; Curto et al., 2022). Therefore, for the analysis of territory management of the research objects, the landscape approach was used, various methods of which are described for solving systemic tasks of design of historic park territories (Lian et al., 2024).

Generative AI tool was employed for linguistic editing and improving the readability of the dedrogram Figure 3; all content and the final wording were reviewed and verified by the authors.

3. Results and Discussion

According to UNESCO recommendations, three categories of historic park landscapes are distinguished: cultural landscapes, organically evolved landscapes, and associative cultural landscapes. The first category significantly influenced the improvement of land policy in the context of globalization (Lian et al., 2025). Based on the affiliation of ancient parks to the NRF,

they are classified into the categories of BG, DP, ZP, and PMLA of national and local significance.

There is a certain international consensus regarding the differentiated conservation of historic parks. It should be based on their spatial integration into natural eco-networks to achieve the goal of holistic preservation of natural and cultural heritage in accordance with the UN Sustainable Development Goals. Spatial combination of natural and cultural elements with network corridor connections, technological empowerment through remote monitoring, and multifaceted cooperation are proposed (Yu et al., 2025). In this context, Ukraine began the development of a national eco-network as part of the Pan-European Eco-network and the Emerald Network of Europe. The network of artificial NRF objects, represented by 28 BG, 62 DP, 588 PMLA, and 13 ZP of national and local significance (Popovych, 2023), can potentially be included in it. Of these, eight BG, 11 DP, 68 PMLA, and three ZP can be considered ancient parks. For comparison, according to Zachariasz (2008), approximately 16000 historical gardens remain in Poland, including 5859 manor gardens, 2267 palace gardens, and 136 castle gardens.

The distribution of parks according to the physico-geographical regionalization of Ukraine (Marynych et al., 2003) is as follows: mixed forest zone (MFZ) (Ukrainian Polissia) – four, broad-leaved forest zone (BFZ) – 21, forest-steppe zone (FSZ) – 38, steppe zone (SZ) – nine, Carpathian mountainous region (UK) – seven, Crimean mountainous region (CM) – 10. The highest density per unit area of the physico-geographical region is characteristic of CM. However, the largest number of parks (59) were built in landscapes of the forest-steppe nature (FSZ and BFZ). These zones also account for the largest total area of the parks (3,646.17 ha out of 5,526.77. These zones are situated along the same parallel, with the Forest-Steppe Zone (FSZ) serving as a westward extension of the Broadleaf Forest Zone (BFZ). Certain regionalization frameworks (landscape and forestry-based) do not distinguish the BFZ as a separate entity, instead considering it part of the FSZ that stretches from the eastern to the western borders of Ukraine. Both zones are characterized by a temperate climate, dissected topography, picturesque landscapes, rich and fertile soils, an extensive hydrological network, and a broad spectrum of landscape and biotic diversity. A general description of the parks is presented in Table 1, Figure 2 and in the Appendix.

Table 1. Representativeness of Historic Parks in the Administrative and Physico-Geographical Regions of Ukraine

Regions	Categories of Protected Areas				Total
	BG	DP	PMLA	ZP	

oblast	rfg	N	S	N	S	N	S	N	S	N	S
Autonomous Republic of Crimea	CM	1	876.60			9	276.20			10	1152.80
Lviv region	UK, BFZ	2	44.55	1	5.00	6	115.3			9	164.85
Khmelnysky region	BFZ					8	175.70			8	175.70
Vinnysia region	FSZ					8	254.00			8	254.00
Cherkasy region	FSZ			1	168.00	5	644.50			6	812.50
Kharkiv region	FSZ	1	41.90			4	169.90	1	22.00	6	233.80
Kyiv city	MFZ, FSZ	1	22.50	1	6.50	2	19.5	1	39.50	5	88.00
Ternopil region	BFZ	1	200.00			4	65.00			5	265.00
Zhytomyr region	MFZ, FSZ					5	119.80			5	119.80
Kyiv region	FSZ			1	405.80	3	488.50			4	894.30
Sumy region	FSZ			1	21.00	2	311.70			3	332.70
Kirovohrad region	SZ			1	109.00	2	61.70			3	170.70
Poltava region	FSZ			1	8.92	2	122.00			3	130.92
Chernivtsi region	UK	1	3.50	2	22.30					3	25.80
Mykolaiv region	SZ					1	28.00	1	23.00	2	51.00
Odessa region	SZ	1	16.00			1	49.00			2	65.00
Rivne region	BFZ					2	39.00			2	39.00
Chernihiv region	FSZ			1	204.40	1	40.00			2	244.40
Volyn region	MFZ					1	13.60			1	13.60
Dnipropetrovsk region	SZ					1	45.00			1	45.00
Zakarpattia region	UK					1	38.00			1	38.00
Kherson region	SZ			1	210.00					1	210.00
Total		8	1205.05	11	1160.92	68	3076.4	3	84.50	90	5526.87

Note: N – number of objects, S – area of objects in hectares, rfg – physical-geographical zones.

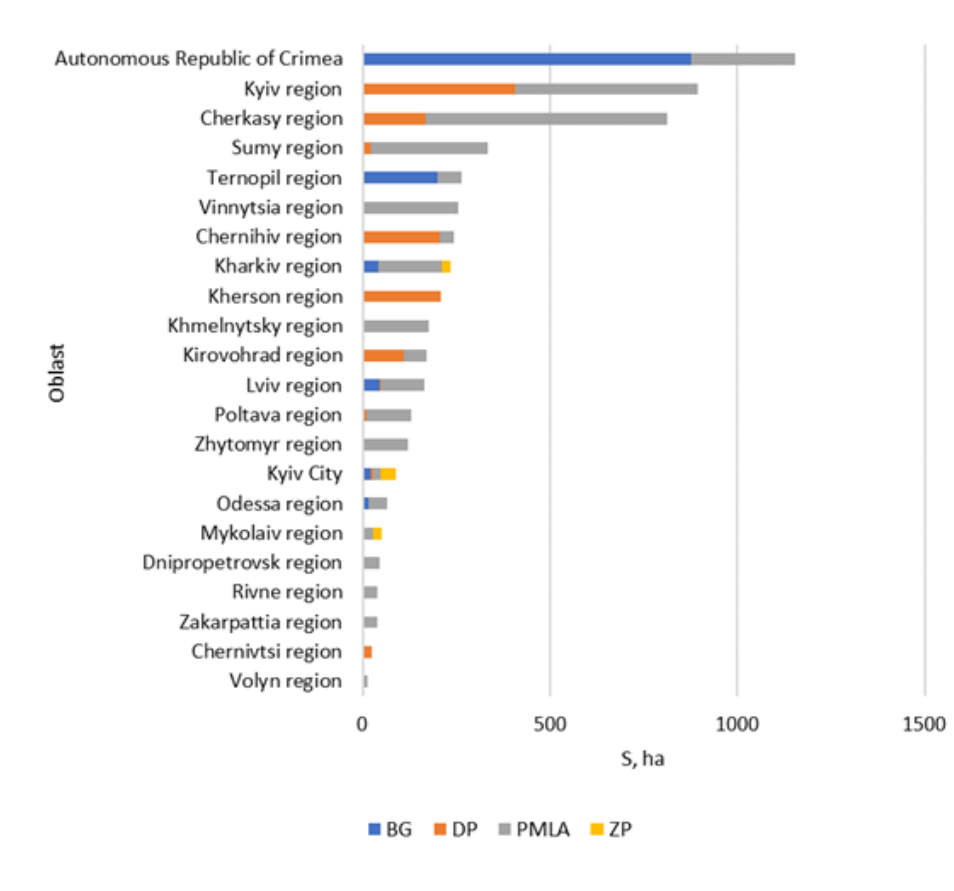


Figure 1. Distribution of historical protected sites across Ukrainian regions, ranked in descending order

Five urban historical centers were identified based on the criterion of park proximity. (1) The largest is the Kyiv center. It combines five objects: one BG, one DP, one ZP, and two PMLA with a total area of 88.00 ha. Only the ZP is represented in the Polissia type of landscape. The remaining objects are located in the forest-steppe part of the Dnieper Upland. (2) The Lviv center consists of two BG and one PMLA with an area of 100.55 ha. Their landscapes belong to the Roztochcha-Opillia hilly-mountainous region. (3) The Kharkiv center has one BG and one ZP with an area of 63.90 ha. They are characterized by forest-steppe landscapes of the western spurs of the Central Russian Upland. (4) The Chernivtsi center covers one BG and one DP with an area of 8.30 ha. Both objects were formed in the landscapes of the Ciscarpathian Upland. (5) The South Crimean center, which is not defined within only one ancient city, is somewhat different. It combines parks of ten small cities located near each other along the line of the Southern Coast of Crimea. These parks occupy coastal mountainous landscapes with subtropical native flora and exotic introduced tree plantings, and centuries-old trees. Historic parks are absent in Sevastopol, Ivano-Frankivsk, Zaporizhzhia, Donetsk, and Luhansk regions.

The landscape diversity of the Forest-Steppe Zone (FSZ) and the Broadleaf Forest Zone (BFZ) proved to be most optimal for ancient park construction, hosting 59 objects. Similarly, the landscapes of the Southern Coast of Crimea exhibit significant diversity. A certain regularity is observed: the more diverse the natural environment, the greater the interest it garners from park builders, landscape architects, artists, and, presently, researchers.

Furthermore, all 90 sites within the network were differentiated based on the population size of the administrative units in Ukraine where the parks are situated. As a result, the sites were categorized into six groups: Group 1: megacities with a population of one million or more (Kyiv, Kharkiv, Dnipro, Odesa) – 9 sites (10%); Group 2: medium-sized cities with populations ranging from 100,000 to one million – 10 sites (11%); Group 3: small towns with 10,000–99,000 residents – 19 sites (21%); Group 4: urban-type settlements with 5,000–9,000 residents – 13 sites (15%); Group 5: villages with fewer than 5,000 residents – 38 sites (42%); and Group 6: forested areas – 1 site (1%). In total, 38 sites (42%) are located within urban areas of various scales. This distribution highlights a strategic priority in Ukrainian park-building toward small towns, settlements, and villages, where the natural environment is typically less disturbed, providing superior conditions for recreation and health improvement (Figure 2).

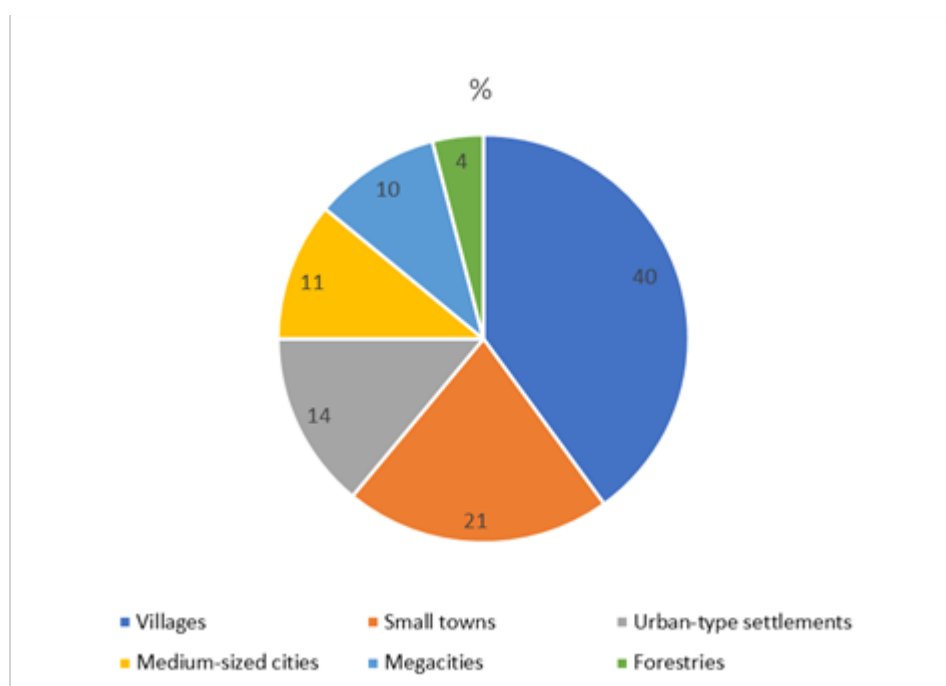


Figure. 2. Distribution of historical protected parks across different settlement categories based on population size (%)

The cluster analysis of the similarity of administrative regions by area and number of historical sites present in them revealed four distinct groups. Figure 3 shows dendrogram based

on hierarchical cluster analysis of historical protected sites presence within 22 Ukrainian administrative regions.

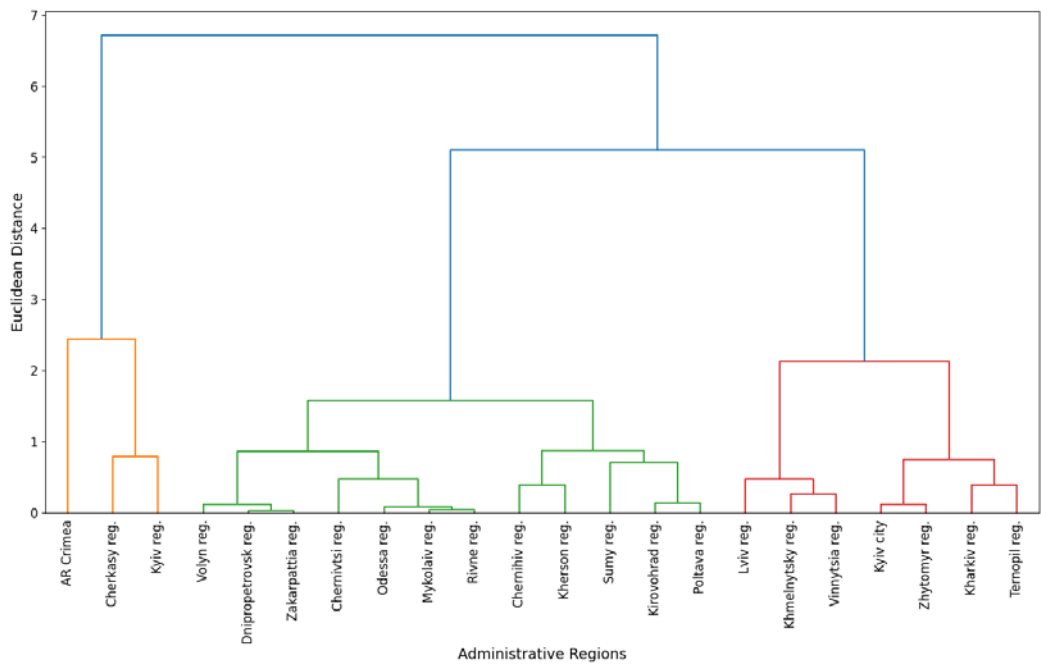


Figure. 3. Dendrogram of the hierarchical cluster analysis of Ukraine's historical park network by regional distribution (generated using Python/Google Colab, Ward’s method).

Cluster 1 consists of 9 regions (Sumy, Kirovohrad, Poltava, Rivne, Chernihiv, Volyn, Dnipropetrovsk, Zakarpattia, and Kherson). Cluster 2 includes 6 regions: the Autonomous Republic of Crimea (ARC), Kyiv, Cherkasy, Khmelnytskyi, Vinnytsia, and Zhytomyr. Cluster 3 comprises 4 regions (Lviv, Ternopil, Chernivtsi, and Odesa), while Cluster 4 contains 3 units: Kharkiv and Mykolaiv regions, along with the city of Kyiv. According to the factor analysis results, both the number and the total area of historical protected sites exert a significant influence on the differentiation between regions. The first factor accounts for 36.1% of the variance, while the cumulative variance explained by the first two factors reaches 65.9%.

In nature conservation science, a specific area of research is gaining particular popularity—nature conservation management—which is still poorly studied but sufficiently methodologically aware. The formation of cadastres of historic parks is also a poorly developed scientific problem in the field of biodiversity management (Popovych, 2023). Effective protection and utilization of heritage resources involve detailed planning of ecosystem, cultural, and social services, alongside management practices (Zhou & Zhai, 2026). In this context, the assessment of the conservation value of sites is conducted based on a rigorous scientific methodology for calculating the quality of flora and vegetation diversity (Paquette et al., 2023).

In spatial organization projects for ancient parks, a key priority is the preservation of their landscape values, as emphasized by the European Landscape Convention (Council of Europe, 2006). Artistic solutions are of significant importance for the landscape design of historic parks; over the past two decades, these have been increasingly aligned with nature conservation measures. This provides a deeper understanding of site-specific challenges (Levy, 2024). The effectiveness of landscape management in ancient parks influences ecological and social outcomes, as well as the attitudes of local communities toward nature conservation initiatives and the role of tourism. Therefore, a new strategy for the perception and understanding of the significance of historic parks is required (Silva et al., 2024; Zhang et al., 2025). Public involvement in the planning process is considered a decisive factor for landscape and heritage conservation programs and their social integration into financial and economic models (Pantaloni et al., 2025).

Functional zoning serves as the foundation for the spatial organization of historic park landscapes. There are certain features of functional zoning schemes for different categories of NRF objects, which is due to their tasks. Functional zoning for ancient BG, DP, PMLA, and ZP is the main knowledge-intensive and mandatory section of the Project for the Organization of Natural Reserve Territories, Protection and Use of Their Natural Complexes. According to these documents, in BG, DP, PMLA, the following are distinguished: strict protection zone, exhibition zone, scientific zone, and administrative and economic zone, and in ZP – exhibition, scientific, recreational, and economic zones. The ratio of the subzones' areas depends on the specific site conditions. Building upon the functional zoning developed by Kucheryavyy (2005), an improved version of functional zoning for BG, DP, and PMLA is proposed (Table 2).

Table 2. Model of Polyfunctional Organization of an Ancient Protected Park

Sub-zones	Conservation Sub-regimes	Visitation Regimes	Objects of Conservation	Architectural and Planning Organization Techniques
Strict Protection Zone (<i>Reserve Zone</i>)				
Regulated Protection	Strictly regulated	Prohibited or limited visitation	Remnants of native or restored natural ecosystems	-
Scientific Zone				
Research and Experimental	Strictly regulated	Visitation allowed only for scientific and technical service staff	Nurseries, selection and vegetation plots, phenopoints, etc	Formal style, less often Mixed style
Outdoor Collection			Closed botanic-geographic sections,	Formal style, less often

			scientific arboretum, collection gardens	Mixed style
Indoor Collection			Compositions of closed conservatories, greenhouses	-
Exhibition Zone				
Open Exhibition	Regulated Non- Targeted Preservation	Limited, periodic, temporary, local, sightseeing, thematic, seasonal visitation	Open botanic-geographic sections, arboretums, decorative gardens	Formal style, Informal style, Mixed style
Closed Exhibition			Compositions of outdoor orangeries and glasshouses	According to the type of exposition
Recreational			Active and passive rest, walks	Rest points and sections
Demonstration	Temporary Targeted Use	Unlimited visitation	Stationary and mobile exhibits	
Administrative and Economic Zone				
Administrative	Careful Use	Unlimited visitation	Administrative and laboratory buildings, etc.	Formal style, less often Mixed style
Economic			Utility yard, elements of landscaping and recreation	

By introducing the concept of 'subzones,' such zoning will incorporate more conservation aspects for the holistic preservation of vegetation cover and provide a system of regimes for its conservation and utilization. We consider it appropriate to introduce relevant amendments and additions to the legislation governing the Nature Reserve Fund (NRF). Based on the significance of each functional zone, it is advisable to implement indicative area ratios into conservation practice: the strictly protected zone should account for 10–15% of the total park area, the scientific zone 15–25%, the administrative-economic zone up to 5%, and the expository zone 50–75%.

Taking into account the scientific and legal aspects, a system of conservation regimes is being developed for each historic park. This system comprehensively integrates passive and active forms, types and subtypes of conservation regimes across various levels of the parks' landscape organization. The passive form is implemented in the subzone of absolute protection with a corresponding conservation regime. For the active form, four conservation regimes are proposed. Specifically, the regulated protection regime involves a sub-regime of strict regulation of activities. It is advisable to implement this sub-regime in the following subzones: absolute protection, research-and-experimental, and collection-based subzones. The indirect conservation regime includes a sub-regime of regulated non-target preservation. The eco-balanced utilization regime comprises two sub-regimes: temporary targeted use and careful

rational use. The restoration regime is introduced in areas where valuable elements of the park environment have been lost.

4. Conclusions

The article presents long-term research results regarding the current network of ancient parks in Ukraine (BG, DP, PMLA, ZP), which are over 100 years old and designated as part of the Nature Reserve Fund (NRF) in accordance with national legislation. Inventory studies established that the contemporary network of historic parks comprises 90 objects: eight BG, 11 DP, 68 PMLA, and three ZP. Their spatial distribution is closely linked to the diverse ecological conditions of physical-geographical zoning. The Forest-Steppe Zone (FSZ) possesses the highest degree of natural and geographical diversity, hosting 38 parks. Its extension in Western Ukraine is the Broadleaf Forest Zone (BFZ) with 21 objects. The Crimean Mountains (CM) rank third in the number of parks (10), although this region leads in terms of park density per unit area.

Out of Ukraine's 27 administrative regions, 22 possess historic parks. The Autonomous Republic of Crimea leads in both the number and total area of these sites. Within urban agglomerations, five historic centers of park construction have been identified, the largest being the Kyiv center, which concentrates one BG, one DP, one ZP, and two PMLA, covering a total area of 88.00 hectares.

The study differentiated all 90 sites within the network based on the population size of the administrative units of Ukraine where the historical parks are located. Furthermore, four distinct clusters of historical protected landscape sites were identified (based on their quantitative indicators) according to their distribution across administrative regions (oblasts).

A model of eco-balanced polyfunctional zoning for parks has been developed based on concepts of the landscape organization of their territories. Based on the significance of each functional zone, the following indicative ratios are proposed: the strictly protected zone should constitute 10–15% of the total park area, the scientific zone – 15–25%, the expositional zone – 50–75%, and the administrative-economic zone – up to 5%.

A system of conservation, restoration, and eco-balanced resource utilization regimes has been developed for each functional zone and subzone. Looking ahead, ancient protected parks in Ukraine require the development of the following priority research areas: landscape mapping, biodiversity inventory with the identification of rare elements, detection of ecosystem dynamics trends, and ecological-economic assessment of natural and cultural heritage in the context of

modern threats, their protection, social identity, and importance for future development at the national level and, especially, in an international context. Furthermore, research should be dedicated to the current state of management, cultural value, and the challenges of integrating ancient parks into various types and ranks of conservation networks.

Author Contributions: Both authors have contributed significantly to this research. Material preparation and data collection were mainly performed by S. Popovych. All authors commented on previous versions of the manuscript. All authors read and approved the final version of the manuscript.

Funding: This research work received no external funding.

Conflict of Interest: No potential conflict of interest was reported by the authors.

Acknowledgements

The authors express their profound gratitude to the Armed Forces of Ukraine for providing the opportunity to pursue scientific work, and to the global community for the support that enables our continued perseverance. Thanks to Professor Carey Clark from the Central Arkansas University for the linguistic consultation.

References

- Bello, A.A. & Batch, A. (2025). Floristic Diversity and Cultural Heritage of Aleppo's Public Park: Toward Sustainable Urban Green Space Management. *Trees, For. People*. 22, e101024. <https://doi.org/10.1016/j.tfp.2025.101024>
- Buckwell, A., Ariki, M. P., Oire, C.m Unga, C., & Fleming, C. (2024). Twenty five years of world heritage status: Show us the benefits! *J. Environ. Manage*. 358, e120849. <https://doi.org/10.1016/j.jenvman.2024.120849>
- Carrari, E., Bellandi, A., Costafreda-Aumedes, S., Dibari, C., Ferrini, F., Fineschi, S., Giuntoli, A., Manganelli R.D.F, Moriondo, M., Mozzo, M., Padovan, G., Riminesi, C., & Bindi, M. (2024). A novel framework of smart monitoring to face the challenges of tree management in historic gardens. *Environ. Res*. 262, 1, e119790. <https://doi.org/10.1016/j.envres.2024.119790>
- Carrari, E., Aglietti, C., Bellandi, A., Dibari, C., Ferrini, F., Fineschi, S., Galeotti, P., Giuntoli, A., Manganelli, R. D. F., Moriondo, M., Mozzo, M., Padovan, G., Riminesi, C., Selvi, F., & Bindi, M. (2022). The management of plants and their impact

- on monuments in historic gardens: Current threats and solutions, *Urban For. Urban Green.* 76, e127727. <https://doi.org/10.1016/j.ufug.2022.127727>
- Chen, L., Huang, H., Han, D.g., Wang, X., Xiao, Yi, Yang, H., & Du, J. (2023). Investigation on the spatial and temporal patterns of coupling sustainable development posture and economic development in World Natural Heritage Sites: A case study of Jiuzhaigou, China. *Ecol. Indic.* 146, e109920. <https://doi.org/10.1016/j.ecolind.2023.109920>
- Cheng, L., Ju, Yi., Wang, T., Wall, G., Li, J., & Wang, M. (2025). *Tour. Manage.* 108, e105124. <https://doi.org/10.1016/j.tourman.2024.105124>
- Council of Europe. European Landscape Convention. *Official Journal of Ukraine.* 2006;14:102. Available from: https://zakon.rada.gov.ua/laws/show/994_154#Text [Accessed 9 Dec 2025].
- Curto, D., Garzulino, A., Menini, G., & Schiesaro, C. (2022). Sustainable conservation and management of a 20th-century landscape in the Alps: The former sanatorium village of Sondalo, *Sustainability.* 14(12), e22. <https://doi.org/10.3390/su14127424>
- Funsten, C., Borsellino, V., & Schimmenti, E. (2020). A systematic literature review of historic garden management and its economic aspects. *Sustainability.* 12(24), e10679. <https://doi.org/10.3390/su122410679>
- Gothein, MLS. A History of Garden Art. Archer-Hind L, trans. In: Wright WP, ed. A History of Garden Art: From the Earliest Times to the Present Day. Cambridge Library Collection - Botany and Horticulture. Cambridge University Press; 2014:iii-iii.
- Hosseini, Z., & Caneva, G. (2022). Lost gardens: From knowledge to revitalization and cultural valorization of natural elements. *Sustainability.* 14(5), e2956. <https://doi.org/10.3390/su14052956>
- Information and analytical materials of the Ministry of Environmental Protection and Natural Resources of Ukraine on the issue of “Analysis of the areas of the nature reserve fund of Ukraine by administrative-territorial units for 2020”, Ministry of Environment of Ukraine, Kyiv, 2021. <https://wownature.in.ua/wp-content/uploads/2021/05/Dovidka-PZF-2020-V3.0-.pdf>
- Jagiello, M. (2021). Do we need a new Florence Charter? The importance of authenticity for the maintenance of historic gardens and other historic greenery layouts in the context of source research (past) and taking into account the implementation of the sustainable development idea (future). *Sustainability.* 13(9), e4900. <https://doi.org/10.3390/su13094900>

- Kim, S., Sung, J., Hamm, Y., & Cho, S. (2022). A garden network system for sustainable garden tourism in South Korea. *Urban For. Urban Green.* 74, e127662. <https://doi.org/10.1016/j.ufug.2022.127662>
- Kucheryavyyi, V.P. Ozelenennia naselenykh mist. Svit, Lviv, 2005. [Ukrainian].
- Leonenko, V.B., Stetsenko, M.P., & Voznyi Yu.M. Atlas pryrodno-zapovidnoho fondu Ukrainy. Dodatok do Atlasu ob'ektiv pryrodno-zapovidnoho fondu Ukrainy. Publishing and printing center Kyiv University, Kyiv, 2003. [Ukrainian].
- Levy, S. (2024). Showing and doing: Art & Science collaborations for Environmental sustainability, *Nature-Based Solut.* 6, e100135. <https://doi.org/10.1016/j.nbsj.2024.100135>
- Li, J., Huang, Z., Zhu, Z. & Ding, G. (2024). Coexistence Perspectives: Exploring the impact of landscape features on aesthetic and recreational values in urban parks. *Ecol. Indic.* 162, e112043. <https://doi.org/10.1016/j.ecolind.2024.112043>
- Lian, J., Nijhuis, S., Bai, N., Bracken, G., Zhang, H., Wu, X., Chen, D., & Li, J. (2025). Understanding historic gardens for the sustainable land management of cultural landscapes: Chengde Mountain Resort (CMR) as a case study. *Environ. Sustain. Indic.* 28, e100952. <https://doi.org/10.1016/j.indic.2025.100952>
- Lian, J., Nijhuis, S., Bracken, G., Wu, X., Wu, X., & Chen, D. (2024). Conservation and development of the historic garden in a landscape context: A systematic literature review, *Landsc. Urban Plan.* 246, e105027. <https://doi.org/10.1016/j.landurbplan.2024.105027>
- Lian, J., Nijhuis, S., Bai, N., Bracken, G., Zhang, H., Wu, X., Chen, D., & Li, J. (2025). Understanding historic gardens for the sustainable land management of cultural landscapes: Chengde Mountain Resort (CMR) as a case study. *Environ. Sustain. Indic.* 28, e100952. <https://doi.org/10.1016/j.indic.2025.100952>
- Marynych, O.M., Parkhomenko, H.O., Petrenko, O.M., & Shyshchenko, P.H. (2003). Udoskonalene fizyko-heohrafichne zonuvannia Ukrainy. *Ukr. Geogr. J.* 41 16–20. [Ukrainian].
- Pantaloni, M., Zucchini, M., Zenobi, G., Lodolini, E. M., Marinelli, G., Minelli, A., & Neri, D. (2025). Sustainable management strategy to preserve Green Infrastructure Heritage. The traditional landscape of olive trees in the city of Ancona, Italy, *Land Use Policy.* 156, e107603. <https://doi.org/10.1016/j.landusepol.2025.107603>

- Paquette, A., Pellerin, S., & Poulin, M. (2023). Using plant community uniqueness and floristic quality assessment in management decision-making in an urban park setting, *Urban For. Urban Green*. 84, e127925. <https://doi.org/10.1016/j.ufug.2023.127925>
- Popovych, S.Yu. (2012). Formuvannia ta suchasnyi stan merezhi pryrodno-zapovidnoho fondu Stepovoi zony Ukrainy. *Nat. Prot. Ukr.* 18(1–2) 4–11. [Ukrainian].
- Popovych, S.Yu. (2016). The network of the Nature Reserve Fund of the Ukrainian Polissia. *Nat. Conserv.* 22 (1) 42–47. [Ukrainian].
- Popovych, S.Yu. Okhorona pryrody. Textbook, Educational Book – Bohdan, Ternopil, 2023. [Ukrainian].
- Popovych, S.Yu.. & Vlasenko, A.S. (2019). Merezha sztuchnykh zapovidnykh parkiv baseinu richky Dnister u mizhrehionalnomu vymiri. *Ukr. J. For. Wood Sci.* 10(2) 64–71. <http://dx.doi.org/10.31548/forest2019.02.064> [Ukrainian].
- Rosłon-Szeryńska, E., Łukaszewicz, J., & Fortuna-Antoszkiewicz, B. (2020). Manor Parks in Poland—Costly Heritage or Potential for the Development of Rural Communes. *Sustainability*, 12(22), 9422. <https://doi.org/10.3390/su12229422>
- Sharma, P., Yadav, P., Gowrish, N.N., Kumar, S., Singh, S. K., Kanga, S., Meraj, G., Kumar, P., & Durin, B. (2025). Comprehensive inventory and quantitative assessment of potential geoheritage sites in the Malwa region, Punjab, *Int. J. Geoherit. Parks*. 13(2) 189–204. <https://doi.org/10.1016/j.ijgeop.2025.01.003>
- Silva, L. F., Carballo-Cruz, F., & Ribeiro, J. C. (2024). Residents’ perceptions of tourism development in the context of a new governance framework for Portuguese protected areas: The case of a small peripheral natural park, *J. Rural Stud.* 112, e103451. <https://doi.org/10.1016/j.jrurstud.2024.103451>
- Silva, T.M., Silva, S., & Carvalho, A. (2022). Economic valuation of urban parks with historical importance: The case of Quinta do Castelo, Portugal. *Land Use Policy*. 115, e106042. <https://doi.org/10.1016/j.landusepol.2022.106042>
- State Cadastre of Territories and Objects of the Nature Reserve Fund of Ukraine as of 01.01.2013. http://menr.gov.ua/images/blog/news/27_04_2015/kadastr.docx.
- Statistical data of the Ministry of Ecology and Natural Resources of Ukraine at the beginning of 2019, in: National report on the state of the environment in Ukraine in 2018, Kyiv, 2019.

- Xu, L., He, G., & Chen, L. (2024). World natural heritage conservation integrates the sustainable development goals from the public perspective in Guilin, China. *Environ. Sustain. Indic.* 23, e100457. <https://doi.org/10.1016/j.indic.2024.100457>
- Yoon, S.-J., & Kwon, J.-W. (2010). A study of the conservation policy and management status of historic gardens in England-Focused on the National Trust. *J. Korean Inst. Tradit. Landsc. Archit.* 28 131–143.
- Yu, Y., Yu, B., Zhang, X., Ma, L., Zhao, C., Jia, Ya., Hou, S., Han, X., Li, K., Chen, X., Li, C., & Liu, B. (2025). Construction of symbiosis corridors for heritage resources and optimization of conservation strategies in the basin: A case study of the Yellow River basin in Shandong, China. *Ecol. Indic.* 178, e113962. <https://doi.org/10.1016/j.ecolind.2025.113962>
- Zachariasz, A. (2021). Projektowanie parków zabytkowych – kompozycja, wartości kulturowe, programy funkcjonalne i wyposażenie. In I. Wieczorek (Ed.), *Rewaloryzacja zabytkowych parków – przykłady działań jednostek samorządu terytorialnego na rzecz zachowania dziedzictwa przyrodniczego województwa łódzkiego* (pp. 75-94). Wydawnictwo Narodowego Instytutu Samorządu Terytorialnego. [Polish].
- Zachariasz, A. (2008). Zabytkowe ogrody – problemy rewitalizacji, utrzymania i zarządzania w świetle zaleceń Karty Florenckiej. *Prace Komisji Krajobrazu Kulturowego*, 10. [Polish].
- Zhang, Yu., Vanclay, F., & Hanna, P. (2025). How communities and social impacts are considered in policies for protected areas in China, *Land Use Policy*. 148, e107404. <https://doi.org/10.1016/j.landusepol.2024.107404>
- Zhou, Y., & Zhai, J. (2026). Preserving the past, cultivating the future: Integrating canal heritage with blue-green infrastructure in composite corridors for Canal Cultural Park planning, *Environ. Dev.* 57, e101384. <https://doi.org/10.1016/j.envdev.2025.101384>