

Preserving and improving biodiversity in Historic Urban Landscape

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Abstract: In the theoretical framework of the research, focused on urban biodiversity, it seems crucial to include those landscape fabrics and ecological networks composed by a wide range of heritage open space systems, strongly featuring urban and periurban areas and building a specific *Historic urban Landscape* (according with UNESCO definition, 2011). Often interpreted as single and isolated heritage sites, each historic open space, if appropriately planned, designed and managed with a relational landscape approach and a proactive attitude, can offer a crucial contribution in supporting and fostering urban biodiversity. Moreover, exploring the concept of biological diversity and trying to reinterpret it according to a specific research dimension, the paper proposes the introduction of the term *temporal diversity*, to be understood as a variety of historical phases, evolutionary sequences, chronological documentation, visible or invisible, present or even just perceptible in a given open space or landscape context. This specific kind of diversity, particularly evident in historic gardens, archaeological places and heritage sites, is immediately recognizable in continuously inhabited urban landscapes, strongly diachronic and dyschronic contexts, where the density and variability of the times pertaining to the different settlement phases are higher, alternating with the progressive stratifications of open spaces; where finally, further layers, more mobile and ephemeral, but no less important, attest the temporality and seasonality in the use of places and their continuous daily variation.

Keywords: Historic Urban Landscape; historic gardens; temporal diversity; landscape approach; urban biodiversity

“Gardens as cultural assets must become scientific model laboratories to understand cultivation and conservation as essential cultural tasks of our societies. These challenges must lead to a new understanding of nature that initiates and perpetuates a responsible, humane sense of life through the gardens.”
(M. Rohde 2022)

1. Focusing on biodiversity in Historic Urban Landscape

In the theoretical framework of the research, focused on urban biodiversity, it seems crucial to include those landscape fabrics and ecological networks composed by a wide range of heritage open space systems, strongly featuring urban and periurban areas and building a specific *Historic urban Landscape*. This peculiar kind of urban landscape is often a suitable ambit to explore and interpret biodiversity issues in historic cities. Beyond that, HUL is an important field of planning/design experimentation in landscape architecture, when considering goals as preserving and improving biodiversity.

As stated by UNESCO Recommendation drafted on November 10th, 2011, *Historic urban landscape* (HUL) can be defined as the “urban area understood as the result of a historic layering of cultural and natural values and attributes, extending beyond the notion of “historic centre” or “ensemble” to include the broader urban context and its geographical setting”. This wider milieu embraces “the site’s topography, geomor-

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Referee List (DOI 10.36253/fup_referee_list)

FUP Best Practice in Scholarly Publishing (DOI 10.36253/fup_best_practice)

Tessa Matteini, *Preserving and improving biodiversity in Historic Urban Landscape*, © Author(s), CC BY 4.0, DOI 10.36253/979-12-215-0966-3.07, in Roberto Bologna, Anna Lambertini, Luca Solari (edited by), *Nature and City. An Integrated Approach to Urban Biodiversity*, pp. 43-50, 2025, published by Firenze University Press, ISBN 979-12-215-0966-3, DOI 10.36253/979-12-215-0966-3

Fig. 1 – Historic Urban Landscape in Florence, Oltrarno: the network of minute and various open spaces in the first half of the XVII century. Valerio Spada, *Veduta della città di Firenze dal muricciolo dei Padri di S. Francesco al Monte*, metà XVII secolo. (Source: Wikimedia Commons).



phology, hydrology and natural features, its built environment, both historic and contemporary, its infrastructures above and below ground, its open spaces and gardens, its land use patterns and spatial organization, perceptions and visual relationships, as well as all other elements of the urban structure. It also includes social and cultural practices and values, economic processes and the intangible dimensions of heritage as related to *diversity and identity*.¹

This exhaustive, detailed and multidimensional definition was intended to provide the basis for a comprehensive and integrated approach for the identification, assessment, conservation and management of historic urban landscapes within an overall sustainable development framework.

In this sense, the UNESCO *Recommendation* explicitly suggest a “*landscape approach* for identifying, conserving and managing historic areas within their broader urban contexts, by considering the interrelationships of their physical forms, their spatial organization and connection, their natural features and settings and their social, cultural and economic values”².

We may add that the *landscape dimension*, as proposed by the European Landscape Convention (Council of Europe, Florence, 2000)³ is a specific and integrated way of gazing places and territories, supporting their protection/planning/design and management approach, and always considering the landscape as a whole to be an inscindible *unicum*⁴.

Adopting this attitude (already consolidated in Landscape Architecture discipline) it does not seem appropriate to consider separately heritage sites on one side and their natural features/patterns and biodiversity on the other. Instead it's crucial to face the complexity generated by the coexisting and coevolving historical and natural resources integrately.

¹ Available on World Heritage Centre - Recommendation on the Historic Urban Landscape (last access on August, 12th, 2025).

² Ibidem.

³ Reference texts - Council of Europe Landscape Convention (last access on August, 12 th, 2025)

⁴ 1981 ICOMOS IFLA Italian Committee proposal for *Historic Garden Charter*.



Fig. 2 – An aerial view of Boboli garden in Florence. Realized since 1549 and constantly evolving, today is an interface landscape between the walled city and the rural territory of the surrounding hills (Source: google).

2. Historic gardens and heritage sites as laboratories for urban biodiversity

In this framework and considering specifically heritage places, such as historic gardens and archaeological parks and sites located in urban and periurban areas, a reflection on biodiversity issues following a landscape-oriented approach, can be proposed.

Often interpreted as a single and isolated heritage spot, each historic open space, if appropriately preserved, designed and managed with a relational landscape approach and a proactive attitude, can offer a crucial contribution in supporting and fostering urban biodiversity.

First of all, as widely demonstrated by scientific literature in the last decades (Caneva et al. 2007; Signorini 2017), it's important to remind that heritage places often host a rich e peculiar variety of botanical and fauna species.

Also exploring the idea of *diversity* in historic urban landscape can be interesting and promising in order to widen its semantic relevancy and investigate other landscape related issues.

In fact, surveying the concept of biological diversity and trying to reinterpret it according to a specific research dimension, the introduction of the term *temporal diversity* is proposed, to be understood as a variety of historical phases, evolutionary sequences, chronological documentation, visible or invisible, present or even just perceptible in a given open space or landscape context (Matteini 2024).

This specific kind of diversity, particularly evident in historic gardens, archaeological places and more generally in heritage sites, is immediately recognizable in continuously inhabited urban landscapes.

These can often be considered as strongly diachronic and dyschronic contexts, where the density and variability of the times pertaining to the different settlement phases are higher, alternating with the progressive stratifications of open spaces. Moreover, further layers, more mobile and ephemeral, but no less important, attest the temporality and seasonality in the use of places and their continuous daily variation⁵.

⁵ Ibidem.

Fig. 3 – Historic gardens are often important hotspots of biodiversity in the urban fabric. The Ragnaia della Stella (a green architecture for hunting in Boboli) hosts many sclerophyll species of the Mediterranean area, such as *Rhamnus alaternus* L., *Phillyrea latifolia* L., *Phillyrea angustifolia* L., *Myrtus communis* L., but also a broad range of spontaneous species. (Photo T. Matteini 2020).



In particular, focusing specifically on historic gardens, conceived as continually evolving living systems⁶, often essential ecological stepping stones in urban fabric, it's important to remark that they often include botanical collections, resulting from their birth or conception, integrated with subsequent transformations, but also spontaneous natural ecosystems, generated over time due to management (or lack thereof).

⁶ 1981 ICOMOS IFLA Historic Gardens Florence Charter and 1981 ICOMOS IFLA Italian Committee proposal for Historic Garden Charter.

In this sense, we can affirm with Michael Rohde (2022) that historic gardens can create significant social identities of culture and education, but they also “have enormous potential biodiversity (Agenda 2030, SDG 15 Life on Land)”.

To propose their dynamic conservation and integrated, compatible management for the purpose of fostering and improving biodiversity (Prigioniero et al. 2021), it is necessary to understand their historical, evolutionary, climatic, and vegetation dynamics. Archival research can be crucial to understand how the garden has evolved, whether through maps, iconography, or documents and registers that provide specific information on the species present at different times and their management.

Another key issue is the climatic history of the site, that can often be recomposed through a deep and diachronic investigation on archival and bibliographic sources⁷.

As stated by Rohde, proposing to adopt a *Garden Thinking*⁸, to raise the challenge of historic gardens protection and management with awareness, grounding on an effective and appropriate toolbox, creating an interdisciplinary and multiprofessional research team is absolutely necessary, in order to interpret and understand relationship, interaction and conflicts between living components and architectural ones⁹.

3. An applied case study: the Oltrarno open space system in Florence

Specifically focusing on Urban biodiversity, a case study of potential great interest is the Oltrarno open space system in Florence, recently included in the new UNESCO core zone¹⁰.

Featured by a minute network of several historic public and private gardens and parks (such as Boboli, Bardini, Torrigiani and Annalena gardens, Villa Strozzi al Boschetto park) and heritage sites (San Miniato and San Salvatore al Monte, Porte Sante Cemetery, Monte Oliveto Monastery etc.) and strictly related with the various and layered structures of the city walls (both existing or demolished) the whole system has been recomposed and, we could say, infrastructured in the 1870s by the historic greenway of the Viale dei Colli (Pozzana 2003), planned and designed by Giuseppe Poggi, supported by the gardener Attilio Pucci for the botanic choices.

This unique landscape boulevard, realised with huge earthworks and planting sequences and intended to offer a belvedere promenade over Florence, consolidated an organic system of open spaces, became today an essential ecological network for preserving and enhancing urban biodiversity.

Within this remarkable ecological complexity and botanical variety, we can currently recognize several different landscape layers and vegetation codex. Just proposing hereby a tentative and not exhaustive list: some layers can be referred from one side to

⁷ For Florence gardens, a crucial source is the Library/Archival repository of the Osservatorio Ximeniano conserving data since the second half of XVII century (*Osservazioni Metereologiche fatte a Firenze dagli Accademici del Cimento tra il Dicembre 1654 e il Marzo del 1670* in Ferdinando Meucci, *Le prime osservazioni meteorologiche: Studi sul clima di Firenze nella seconda metà del secolo XVII*, R. Istituto di studi superiori di Firenze, Archivio meteorologico, 1873.

⁸ In original “Garten-Denken” proposed by Michael Rohde, quoting Hubert Markl (Rohde 2019, 32).

⁹ In this sense, a case study investigated since 2022 is the historic Medici garden of Villa La Quiete in Florence which has been analysed through an interdisciplinary research cluster, composed by various scholars from different disciplinary fields (B. Foggi, G. Galletti, L. Ghelardini, G. Ghinassi, T. Matteini) and early researchers (C. Bartolucci, V. Castellucci, E. Della Giovampaola, C. Goodrich, E. Paglia) and focused on active and dynamic conservation of the garden. (Galletti, Matteini 2026).

¹⁰ The boundaries of the property - Firenze Patrimonio Mondiale, last access on August, 28th, 2025.

Fig. 4 – The Viale dei Colli boulevard, realized in the second half of the XIX century is today a crucial ecological network connecting many of historic open spaces of the Oltrarno area. (Photo T. Matteini 2019).



Medici gardens vegetation features and botanical collections (Ghinassi et al. 2014); from the other to historic landscape agricultural patterns; some are linked to the Giuseppe Poggi and Attilio Pucci great Masterplan and botanical palette for Viale dei Colli; then we have the huge repertory of spontaneous species growing in these various habitats. In fact, in the Oltrarno area it is possible to survey pioneer species in abandoned areas; new species in historic gardens due to climatic change; ruderal species growing in the city wall, hygrophilous species along the river fringes, and many more.

This *Historic Urban Landscape* has been studied and explored over five years (2018-2023) within the Laboratory dedicated to Preservation of Historic Gardens and Parks¹¹, in the framework of the Landscape Architecture Master at the University of Florence¹².

Teachers and students worked specifically on Boboli garden, intended as an integrated tile of a broader and more complex landscape mosaic. In this case, the historic garden has been considered, not only a heritage site, but also a living part of an ecological and landscape network, which has a great potential to be a biodiversity and temporal diversity hot-spot within the urban context.

Actually, Boboli can be interpreted as an ecotonal open space connecting the historic Walled City with the periurban landscape systems: for this crucial role, the garden has a remarkable ecological value and is considered a biodiversity hotspot (Gellini et al. 1991)¹³.

¹¹ Teachers L. Ghelardini and P. Capretti for *Plant management and pest control* Course, T. Matteini, *Active conservation of Historic Gardens and Park* Course, with the supporting expertise of G. Galletti and P. Grossoni. Tutors: F. Torelli, V. Castellucci, C. Bartolucci.

¹² Corso di Laurea Magistrale in Architettura del Paesaggio - UniFI Last access on 30.08.25.

¹³ See also B. M. Landi, G. Simonti, D. Angelotti, *Il giardino di Boboli come scrigno di biodiversità: dal collezionismo medico all'attualità*, contribution presented at the Conference/Giornata di Studi, *Orti botanici e biodiversità delle piante*, organized by Accademia dei Georgofili and Società Botanica Italiana, on June, 29th 2023. Available on www.georgofili.net; Last access on 30.08.25.



Fig. 5 – The Oltrarno heritage landscape system interpreted within the Laboratory (A.Barcellesi, S. Gaspari, R.Zeen 2023).

The challenging issues in its active conservation (such as climate change, reduction of biodiversity, plants pathogens and pests) (Carrari et. al. 2022) have been faced yearly within semester laboratories, following an interdisciplinary landscape approach.

Teaching methodology sequence for the Laboratory embraces a first phase of interpretative reading, including landscape frameworking, historical investigations, climatic analysis and a deepened survey on architectural and vegetation features in the garden; a second phase in which a landscape Masterplan is drafted and a third phase dedicated to garden's ambits specific planning/design/management.

Grounding on the outputs, a specific interdisciplinary research project on Oltrarno Historic Urban Landscape could be planned and proposed in order to survey, interpret and face biodiversity issues, with planning, design and managing strategies, defined adopting the *Landscape Approach* recommended by UNESCO¹⁴.

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¹⁴ "The landscape approach is a framework for making landscape-level conservation decisions. The landscape approach helps to reach decisions about the advisability of particular interventions (such as a new road or plantation), and to facilitate the planning, negotiation and implementation of activities across a whole landscape". *UNESCO HUL Recommendation* cit., p. 6 World Heritage Centre - Recommendation on the Historic Urban Landscape (last access on August, 12 th, 2025).

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