EFUF European Forum on Urban Forestry

URBAN FORESTS *for all*

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URBAN FORESTS FOR ALL

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Welcome to the 26th European Forum on Urban Forestry

Clive Davies, Chair of the EFUF Board of Management

Welcome to EFUF 2024, which is being held for the first time in Croatia. It is excellent that we are meeting in the capital city of Zagreb following the initiative of the Croatian Forest Research Institute who have been instrumental in the organisation of EFUF 2024. Organising a forum is however not the sole responsibility of one organisation so I would also like to add my thanks to the Faculty of Forestry and Wood Technology (University of Zagreb), the Croatian Forests Ltd Company, the European Forest Institute (EFUF's strategic partner), the Croatian Forestry Society (section Urban Forestry), the Public Institution Nature Park Medvednica and the Croatian Chamber of Forestry and Wood Processing Engineers. The event is under the auspices of the International Union of Forest Research Organisations (IUFRO) and the City of Zagreb. The Zagreb Tourist Board is sponsoring the event.

It is a considerable privilege to report that EFUF is now holding its 26th annual meeting which is testament to the enthusiasm that exists for urban forests across our continent and beyond. As is usual for 2024 you will find in attendance researchers, practitioners and other professionals dealing with urban forests and green spaces. For 2024 we have focused on practice-oriented contributions although researchers will not be disappointed as there is much new research to share too. We also have big announcements to make at the Forum including the official launch of FAO's introduction to urban forestry e-learning course, which is being hosted on EFUFs digital platform and the launch of the EFUF membership and supporter's scheme.

The theme for 2024 is 'Urban Forests for All' which is broad title, so we have split this across three sub themes. Theme 1 is Urban Forests for People and Society in which speakers will explore the social aspects of urban forests and urban green space planning and management aimed at enhancing the happiness and health of citizens. Theme 2 is Urban Forests for a Sustainable Tomorrow where the forum explores how to achieve well-performing urban forests and urban green spaces with a focus on the assessment of environmental conditions of urban forests. Theme 3 is Urban Forests for All Living Beings where speakers explore urban forests and urban green spaces as habitats for people and other beings.

Please also use the opportunity to view the poster presentations which are always interesting and often a signpost towards future research and practice and do attend the workshops and the EFUF annual forum meeting. The local organisers have also arranged interesting field trips which are always a highlight of EFUF.

Finally, can I remind you that EFUF is active throughout the year and encourage you to visit the EFUF website and download the MyEFUF App to your smartphone.

Clive Davies
May 2024.

EFUF 2024

Conference Organisers

European Forum on Urban Forestry
Croatian Forest Research Institute
European Forest Institute
University of Zagreb, Faculty of Forestry and Wood Technology
Croatian Forests Ltd.
Croatian Forestry Society, Section on Urban Forestry
Croatian Chamber of Forestry and Wood Processing Engineers

Conference Partners

Public Institution Nature Park Medvednica

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Renate Späth I urban forester, retired, Germany
Robert Hostnik I Slovenia Forest Service, Management unit Celje, Slovenia

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Programme

DAY 0 | Tuesday 21st MAY 2024

18.00–21.00 **Welcome reception** at the Croatian Forestry Society

DAY 1 | Wednesday 22nd MAY 2024

08.00–09.30 Registration, walk in

09.00–10.45 **Welcome and opening session** – Chair: **Clive Davies** and **Martina Kičić**

Welcome to EFUF 2024 by:

- EFUF organisation (**Renate Späth**)
- Representatives of the organisers
- Mayor of Zagreb

Local and regional presentations:

- **Ines Androić Brajčić** (Ministry of Physical Planning, Construction and State Assets) - *The development of green urban infrastructure in Croatia*
- **Marijo Spajić** (City of Zagreb) - *How to govern urban forests and green spaces in the context of sustainable cities*
- **Izabela Kuzle** (speaker: **Matea Vuković**) (Croatian Forests Ltd.) - *Sustainable Management of Urban and Peri-urban Forests in the City of Zagreb*

10:45–11:00 **Introducing the EFUF supporter and member scheme** (**Clive Davies**)

11.00–11.30 Coffee and tea break

11.30–12.30 **Keynotes for conference theme 1** – *Urban Forests for People and Society*

Chair: **Clive Davies**

- **Silvija Krajter Ostoić** (Croatian Forest Research Institute) - *Social studies with the public of the city of Zagreb– experiences and lessons learnt*
- **Wendy Y. Chen** (University of Hong Kong) and **Rik De Vreese** (European Forest Institute) - *CLEARING HOUSE: synergising science, practice and policy of UF-NbS*

12.30–13.45 Lunch

13.45–15.00 **Workshops and opportunity to see the posters**

Workshop 1 (room SZ040) - *Empowering Urban Forests - Tree Cities of the World Recognition Program* (**Ana Macias**, Arbocity)

Workshop 2 (room SZ133)- *Defining training needs for urban greening planning with local authorities* (**Rik De Vreese**, European Forest Institute)

Workshop 3 (room ŽZ248) - *PuppetTREE: Caring for Veteran Trees* (**Karen Cantor**, PuppetTREE)

Workshop 4 (room ZZ321) - *How to improve urban tree biosecurity? Participatory approach to improvement of current European practice* (**Dijana Vuletić**, Croatian Forest Research Institute)

15.00–18.00 **Study visit to park Maksimir**

18.00–19.30 **EFUF General Assembly (room SZ040)**

DAY 2 | Thursday 23rd MAY 2024

08.00–08.15 Registration, walk in

08.15–09.15 **Keynotes for conference theme 2** – *Urban Forests for a Sustainable Tomorrow*
Chair: **Silvija Krajter Ostoić**

- **Robert Hostnik** (Slovenia Forest Service) - *Thinking like an Urban Forest: Inspirations, Insights, Decisions, and Results of Practical Forest Management*
- **Stefania Gasperini** (European Arboricultural Council) - *The role of the European Arboricultural Council in enhancing professionalism in tree care and management*

09.15–10.00 **Flash poster presentations**
Chair: **Rik De Vreese**

- **Eduardo Antenucci** - *Comparing different management options of urban forests in terms of emissions and removal capacity of CO2 and PM2.5 in a Mediterranean context*
- **Benno A. Augustinus** - *The European urban tree inventory – an update*
- **Alain Bertschy** - *Hall-like Urban Forests: Sustainable Concept for Temporal Brownfield Transformations*
- **Vicent Calatayud** - *Mapping pollen allergenicity from urban trees: a tool for green infrastructure planning*
- **Lotte Dijkstra** - *Accessible Urban Forestry Education: Launching the FAO eLearning course 'Introduction to urban and peri-urban forestry'*
- **Saskia de Wit** - *Urban Forestscapes. the city of Delft as a woodland complex*
- **Eugenio Ferretti** - *Gardens vs street trees in Lisbon: contribution for the regulating ecosystem services and diversity*
- **Irena Franjić** - *Urban forests as a site for Naturavita project's educational activities – raising awareness about the importance of integrating natural environment in inclusive education*
- **Jason Gordon** - *Perceptions of Tree Risks and Benefits in a Historically African-American Neighborhood*
- **Axel Heinrich** (speaker: **Stevan Stevanovic**) - *Sustainable Roadside Greenery: Long-Term Success of Climate-Resilient Avenue Concepts*
- **Maarten Hogeweij** - *It's not easy being cool: assessing urban greenspace as a heat adaptation strategy based on residents' perceptions*
- **Sanna Ignell** - *Establishment of woody vegetation on urban schoolgrounds*
- **Anna Kajosaari** - *Mapping the perceived health benefits of urban green and blue spaces: A PPGIS study in Vienna, Austria*
- **Andrea Kostelić** - *Challenges - before, during and after construction of Forest Trail Bliznec*
- **Goran Krsnik** - *Towards Better Comparison Methods to Enhance the Provision of Urban Ecosystem Services*
- **Tonko Megyery** - *Carbon stocks in forest floor and soil in sessile oak (Quercus petraea Matt./Liebl.) stands in the Maksimir Park-Forest*
- **Mojca Nastran** - *Safeguarding Childhood Explorations: A Comprehensive Inventory and Analysis of Woody Plants in Ljubljana's Kindergarten Playgrounds"*
- **Alessandro Paletto** - *Citizens' perception of the presence of coypu (Myocastor coypus) in urban environments: the case study of the Urban Park of Serravalle in Central Italy*
- **Maria Chiara Pastore** (speaker: **Claudia Parenti**) - *Phytoremediation as urban forestry strategy. The case study of the Metropolitan Area of Milan*
- **Pablo Pérez Daniëls** - *Study of biodiversity associated to monumental trees in urban forest of Madrid (Spain)*
- **Petra Schoon** - *Modelling the impact of climate change on individual urban tree level*
- **Petra Schoon** - *Growth curves for urban trees based on big green data*
- **Kinya Shiraishi** - *Tokyo's Urban Tree Challenge: Decline in Tree Canopy Cover in Tokyo from 2013 to 2022*
- **Suzanne Simmons** - *Delivering and Establishing Future Trees for Cities*
- **Flora Giulia Simonelli** - *Exploring Relationships: Railway Ecology and Black locust*
- **Luka Šparl** - *Ecological and Nature conservational role of fungi in urban forests*
- **Jan Totzki** (speaker: **Somidh Saha**) - *Interactions between development stages and sites (park vs. street) differently influenced soil respiration of exotic and native urban oak trees*
- **Damir Ugarković** - *Causes and intensities of sanitary felling of forest trees in the urban forest of the city of Zagreb*
- **Francesca Ugolini** - *"Home for Nature": participatory co-design project tailored on the community's groups for the regeneration of an urban green space*
- **Lucianno Massetti** - *What do teenagers value about green spaces?*
- **Ke Wang** - *Exploring the Development of Community Parks in Urban-Rural Fringe Areas in China: Stakeholder Perspectives and Strategies for Sustainable Planning*
- **Ivana Zivojinovic** - *Addressing Societal and Climate Pressures in Urban Forest Recreation: A Comparative Study of Vienna and Zurich*
- **Lorenz Palec** - *Planning for Sustainable Urban Development: Characterization and Valuation of Metro Manila's Iconic Heritage Trees*
- **Jelena Kranjec Orlović** - *Graduate study programme: Close-to-nature forestry*

10.00–10.30 Coffee and tea break
10.30–12.45 **Parallel sessions**

1 – Urban Forests for People and Society Chair: **Martina Kičić** (room ZZ122)	*2 – Urban Forests for a Sustainable Tomorrow* Chair: **Jerylee Wilkes-Allemann** (room ZZ211)	*3 – Urban Forests for All Living Beings* Chair: **Vinko Paulić** (room SZ234)	*4 – Urban Forestry Advances – A global journey* Chair: **Alan Simson** (room ŽZ248)
• **Chris David** - *Tree Equity Score - A tool for climate action in cities* • **Romena Huq** - *How Scottish Forestry innovates in community engagement in urban forests* • **Lotte Dijkstra** - *Arboreal Citizen Participation: More-than-human agency in urban forest planning, design and management* • **Emilia Janeczko** - *Effects of exposure to an urban forest in spring on the psychological response of healthy young adults* • **Vincenzo Giannico** (speaker: **Giovanni Sanesi**) - *The Impact of Urban Green and Grey Spaces on Mental Health: Insights from the inhabitants of Rome* • **Dženan Bećirović** (speaker: **Amila Brajić**) - *Preconditions for strategic development of nature-based tourism in Canton Sarajevo* • **Vladimir Stojanovski** - *The role of cultural ecosystem services as perspective for future urban parks management* • **Alison Dyke** - *Planning for Utopia? Stories of the future Treescape*	• **Tina Simončič** - *Urban forests in multi-objective forest management planning in Slovenia* • **Hans Kasperidus** - *Management and maintenance issues in Leipzig's urban floodplain forest: current potentials and risks* • **Maja Simoneti** - *The role of public participation in urban forests management* • **Anna Kajosaari** - *PPGIS tools in Nordic urban green space planning and management – results from NORDGREEN project* • **Marco Fornaciari** - *The LIFE-CLIVUT experience, a post-pandemic case study of dissemination on climate value of urban trees* • **Philip Chambers** - *Using a location-based game to gather preference data for forest planning* • **Paul Nolan** (speaker: **David Armson**) - *The Mersey Forest at 30 - 1994- 2024*	• **Andrej Verlič** - *Nature protection for all living beings – what does this mean?* • **Edyta Łaszkiewicz** -*Would you walk through here? Urban wildscapes during utility and recreational walks* • **Lisa Strunk** - *Tree-related microhabitats (TreMs) among large trees of five species in three old cemeteries of Karlsruhe City, Germany* • **Iva Franić** (speaker: **Giovanna Lanzavecchia**) - *Diversity patterns of endophytic tree fungi on European urban-rural gradients* • **Anastasia Rubio** - *eDNA analysis revealed higher biodiversity in park trees compared to street trees and in Karlsruhe (Germany) compared to New Haven (USA) among solitary Norway Maple and Red Oak trees* • **Susannah Littlewood** - *Exploring opportunities to plant for roadside air quality in the London Borough of Tower Hamlets* •**Iva Bedenko** – *Nature based solutions and urban orchards in Zagreb* • **Susanne Raum** - *Stakeholder knowledge of tree pests and pathogens and their management in urban areas*	• **Aaron Shearer** - *The urban forests of Iceland* • **Stefano Boeri** (speaker: **Simone Marchetti**) - *Parco Italia* • **Toru Terada** - *Garden trees as an urban forest: Time series changes in species composition and canopy cover in Tokyo's residential suburbs* • **Thomas Carlin** - *Antipodean Insights: Successes, Shortcomings, and Future Challenges of Urban Forests in Aotearoa New Zealand* • **Sophie Moore** - *A Shapshot of Urban Forestry in Eastern Australia* • **Ian Mell** - *Examining the value of Green Infrastructure as a delivery mechanism for sustainable East and South-East Asian cities* • **Dirk Voets** - *Calculating the 3-30-300-rule globally: lessons learned*

12.45–13.45 Lunch
14.00–18.00 **Field visit to a central forest park and the city centre tour**
18.00–19.30 Free time
19.30–22.00 **Conference dinner**

DAY 3 | Friday 24th MAY 2024

08.00–08.15 Registration, arrivals

08.15–09.45 **Keynotes for conference theme 3** – *Urban Forestry for All Living Beings*

Chair: **Cecil Konijnendijk**

- **Keith Sacre** (Barcham Trees) - *Consultation, indoctrination or manipulation?*
- **Giuseppe Scarascia-Mugnozza** (European Forest Institute, Biocities Facility) - *Biocities: forest-based solutions transforming urban living*
- **Sharon Durdant-Hollamby** (Sharon Hosegood Associates Ltd.) - *Trees, planning and construction*

09.45–10.15 Coffee and tea break

10.15–12.15 **Parallel sessions**

1 – Urban Forests for People and Society
Chair: **Renate Späth**
(room ŽZ080)

- **Martina Kičić** - *Inside Zagreb's city districts – the distance and distribution of urban green space influence its perception and use*
- **Jaewon Son** - *Variation in citizens' perception of cultural ecosystem services from Urban green spaces in the Orient and Occident: a case study from Karlsruhe (Germany) and Suwon (Korea)*
- **Johanna Krischke** - *Unfolding the relationship of urban tree species diversity to the subjective well-being of the population - A map-based survey in the urban area of Karlsruhe (South-West Germany)*
- **Arne Arnberger** - *Covid and post-covid recreational impacts - perceptions of land managers in the Vienna metropolitan region*
- **Mariachiara Pastore** (speakers: **Corinna Patetta** and **Claudia Ida Maria Parenti**) - *Forestami: mapping urban green spaces for wellbeing*
- **Michelle Whalley** & **Dave Armson** - *Thrive in the Forest - highlighting the role of urban forests as key infrastructure in education policy*
- **David Pearlmutter** - *Urban trees and pedestrian thermal comfort: the relative contributions of shade and transpiration*

2 – Urban Forests for a Sustainable Tomorrow
Chair: **Robert Hostnik**
(room ŽZ161)

- **Claudia Fongar** - *The role of organisational structure and adaptive management in co-governing urban forests - The case of a co-governance arrangement in Norway*
- **Mirjana Zavodja** - *Priorities and innovation in urban and rural municipal forests: pilot case Germany*
- **Alessandro Paletto** - *Social acceptance of the management of public urban green spaces: a comparative analysis between Romania and Turkey*
- **Justin Morgenroth** - *Urban forest canopy cover goals – an exploration of current practices*
- **Johan Östberg** - *Creating a 100-year management plan for a UNESCO world heritage site*
- **Nataliia Miroshnyk** - *Assessment of the urban green infrastructure transformation, biodiversity and the value of ecosystem services*
- **Ian Whitehead** - *Urban Forestry and Urban Agriculture synergies: from Food Forests to Edible Cities*

3 – Urban Forests for All Living Beings
Chair: **Naomi Zürcher**
(room ŽZ248)

- **Glenn Fischer** - *Instruments and Inventories for Tree Protection*
- **Mariella Marzano** - *Urban Tree Guard- Safeguarding European urban trees and forests through improved biosecurity*
- **Benno Augustinus** - *Tree species composition in and around cities – a biosecurity perspective*
- **Cèilidh Smith** - *Climate change vulnerability and adaptation in urban forestry: A case study from Mission, British Columbia, Canada*
- **Beatrice Sorrentino** - *WRF-Chem simulations at different scales for urban air quality assessment*
- **Yasutomo Hoshika** - *Development of model for optimal tree selection to improve air pollution removal capacity in urban ecosystems -FlorTree*
- **Vinko Paulić** - *Influence of increased soil moisture on tree stability in Zagreb urban forests*

4 – Urban Forestry Advances – Concepts and initiatives
Chair: **Clive Davies**
(room ZZ321)

- **Marina Popijač** (speaker: **Kristina Duvnjak Perković**) - *Importance of forests and green spaces in urban and peri-urban areas – nexus between human well-being and city branding*
- **Alan Simson** - *The Expanding Northern Forest - delivering transformational change in the North of England*
- **Jean-Laurent Pfund** (speaker: **Clémence Dirac**) - *From forest to urban trees: Shall we gather all tree specialists to improve planning and maintenance of treescapes?*
- **René van der Velde** - *Insights and Frontiers for research in urban forest labs: results from the TU Delft Climate Arboreta Project*
- **Hannah Walker** - *Branching Out: Mapping value in urban treescapes*
- **Jerylee Wilkes-Allemann** - *Developing a concept to assess ecosystem service through citizen science*
- **David Myers** - *Tree Canopy Change in Tear-Down Redevelopment: The Challenges of Housing Densification*

12.15–13.15 Lunch
13.15–14.00 **Closing session**
Chair: **Silvija Krajter Ostoić**
- **Introducing FAO Urban Forestry e-learning course** (hosted by EFUF)
- **EFUF 2024 summary of findings**
- **European Young Urban Forester of the Year award 2024**
- **EFUF 2025 presentation and invitation**

14.00 – 18.00 Field visit to Mountain Medvednica

DAY 4 | Saturday 25th MAY 2024

08.00 **Full day post-conference field trip to Varaždin green spaces** (expected return to Zagreb by 16.00)

Plenary talks

The development of green urban infrastructure in Croatia

Androić Brajčić, Ines | Ministry of Physical Planning, Construction and State Assets (Croatia), ines.androicbrajcic@mpgi.hr

ABSTRACT

The presentation will showcase the current work of the Ministry of Physical Planning, Construction and State Assets on the development of green infrastructure in urban areas in Croatia. The Ministry has developed the Urban Green Infrastructure Development Programme until 2030, which was adopted by the Croatian Government. The program aims to establish sustainable, resilient, secure, and pleasant living environments in cities and municipalities, and it represents a political commitment at the national level until 2030. The Ministry, through funds from the National Recovery and Resilience Plan and the Competitiveness and Cohesion Programme 2021-2027, co-finances the creation of green urban renewal strategies for local self-government units and the implementation of urban green infrastructure development projects identified in these strategies. The strategies provide a vision for the urban development of local self-government units and represent a long-term political commitment at the local level. The projects integrate green infrastructure, nature-based solutions, the reuse of abandoned buildings and spaces, achieving energy efficiency goals, adapting to climate change, and strengthening resilience to risks such as extreme weather events. For the purpose of documenting the current state and monitoring the development of urban green infrastructure at the national level, the Ministry has created the Green Infrastructure Registry, a new module within the existing physical planning information system. The Registry enables local self-government units to input the current state of green infrastructure, the spatial scope of green urban renewal strategies, data on green infrastructure projects, and more. Additionally, the Ministry is developing a methodology for the identification of urban heat islands in urban areas, which will include recommendations for measures and spatial solutions to mitigate the effects of urban heat islands.

How to govern urban forests and green spaces in the context of sustainable cities

Spajić, Marijo | Grad Zagreb (Croatia), marijospajic@gmail.com

ABSTRACT

In the dynamic landscape of urban development, continuous pressure of climate change and the need for adaptation, the role of urban forests and green spaces has become increasingly pivotal for fostering sustainable cities. Our mission is to cultivate resilient and ecologically sound urban environments. This abstract outlines the strategic approach in governing urban forests and green spaces, both at the planning and current implementation levels.

Strategy of the City development centers on a comprehensive green infrastructure plan that aligns with the City's vision for sustainability. Through planning, we aim to integrate green spaces seamlessly into the urban fabric, ensuring accessibility, biodiversity, and aesthetic appeal. This involves a dual focus: crafting long-term strategies for future urban development and implementing immediate initiatives that address the pressing environmental challenges faced by our cities.

On the planning level, our approach encompasses the identification of suitable areas for green space expansion, considering demographic trends, and projecting future urbanization, at the same time responding to the requirements of numerous European regulations on nature protection. However, our commitment also extends to the current implementation level, where we strive to enhance existing green spaces and initiate innovative and pragmatic projects that promote sustainable practices. By fostering collaborations with local communities, environmental organizations, and private enterprises, we aim to create a network of well-maintained urban forests and green spaces that serve as lungs for the city, mitigating pollution, reducing the influence of heat islands, managing extreme storm water and supporting overall well-being of the citizens.

In conclusion, this abstract encapsulates dedication to fostering a sustainable urban environment through effective governance, by embracing a strategic planning perspective and immediate acting.

Sustainable management of urban and peri-urban forests in the city of Zagreb

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Babić, Dalibor | Croatian Forests Ltd (Croatia)
Varga, Davor | Croatian Forests Ltd (Croatia)
Vuković, Matea | Croatian Forests Ltd (Croatia)
Otmačić, Tihana | Croatian Forests Ltd (Croatia)
Salopek, Nives | Croatian Forests Ltd (Croatia)

ABSTRACT

The longstanding practices of Croatian Forests Ltd, The Zagreb Forest Administration, are deeply rooted in tradition, experience, and expertise in the management and stewardship of urban and peri-urban forests within the City of Zagreb, owned by the Republic of Croatia. This approach stands as a noteworthy example of effectively preserving forest ecosystems in the City of Zagreb, navigating through various challenges, particularly those arising from urbanization - the city's expansion into forested areas, and addressing damages caused by climate change, including extreme weather events.

Covering 8,485.14 hectares of urban and peri-urban forests, our commitment revolves around preserving natural structures, enhancing vitality, and mitigating the consequences of climate change.

Our proactive measures involve maintaining the natural structure, stability, and vitality of these ecosystems while safeguarding habitats from degradation. Restoration efforts are concentrated on rejuvenating older stands with disturbed structures. Emphasizing the growth of indigenous species through uneven-aged forest management, we naturally revitalize these ecosystems, often supported by strategic planting.

We firmly oppose the transformation of urban forests into parks, recognizing the potential disturbance to balance, biodiversity, and stability within the ecosystem. Our advocacy centres on sustainable practices, emphasizing their importance irrespective of ownership or purpose.

In conclusion, our approach not only serves as a model for effective urban and peri-urban forest management but also underscores our commitment to the preservation of these vital ecosystems.

Urban Forests for People and Society

Keynotes

Social studies with the members of the public of the city of Zagreb - experiences and lessons learnt

Krajter Ostoić, Silvija | Croatian Forest Research Institute (Croatia), silvijak@sumins.hr

ABSTRACT

The public in Zagreb has several means of public participation regarding urban forests and green space. However, a governance analysis showed that public participation is one of the governance building blocks with room for improvement. Perception studies are a form of public participation. They give us insight into how people experience (perceive and use) urban forests and green space and what preferences they might have. The information ideally serves as an input for further planning and management. However, a review showed in Croatia there is a dearth of studies dealing with the public perception of urban forests and green space. I will talk about two research projects conducted in the City of Zagreb targeting the public. One was a regional project conducted in several biggest cities, including Zagreb. It was a first of the kind in the region that gave us an insight into the public perception of urban forests and green space on the city level. The second project built on the results of the previous one but added a spatial dimension to the human experience through participatory mapping. Both projects gave valuable results for researchers and practitioners. Experiences and lessons learnt will be discussed.

CLEARING HOUSE: synergising science, practice and policy of UF-NbS

Chen, Wendy Y | The University of Hong Kong (Hong Kong, SAR China), wychen@hku.hk
De Vreese, Rik | European Forest Institute (Belgium/Germany), rik.devreese@efi.int

ABSTRACT

Supported by EU's Horizon 2020 and China's National Key Research and Development Program, the CLEARING HOUSE project gathered twenty-six international partners' joining efforts for collaborative research and knowledge exchange on the contributions of urban forests, as a subset of Nature-based Solutions (UF-NbS), for sustainable and healthy cities. UF-NbS is widely recognized and actively promoted in both Europe and China, yet, different socioeconomic, cultural and institutional contexts of these two continents bring about varying opportunities and challenges to ensure that UF-NbS can be implemented adequately in a systematic manner. In this presentation, Rik De Vreese and Wendy Chen will share the project's insights from European and Chinese perspectives, respectively, with regard to UF-NbS science, practice and policy, as well as lessons learned for future collaboration across the world. We will introduce the outcomes and outputs of the project in the two continents, and have a look into how the outcomes of the project can be sustained beyond the project life.

Workshops

Empowering urban forests - Tree Cities of the World Recognition program

Macias, Ana | Arbocity (Spain), ana.mp@arbocity.com
Menendez, Claudia | Arbocity (Mexico)

ABSTRACT

Introduction:
Urban forests play a crucial role in enhancing the quality of life in cities. Recognizing the importance of this green infrastructure, the Arbor Day Foundation and the Food and Agriculture Organization (FAO) have jointly initiated the Tree Cities of the World (TCOW) program. The program aims to acknowledge and celebrate cities committed to effectively managing and nurturing their urban forests. This workshop seeks to provide a comprehensive understanding of the TCOW recognition program, offering valuable insights into its principles, benefits, and application process.

Workshop Content:

1.Overview of TCOW:
Participants will gain insights into the key principles of the TCOW program and its significance in promoting sustainable urban forestry.

2.Global Examples and National Partners:
The workshop will showcase exemplary initiatives undertaken by national partners in different countries. Participants will learn from real-world examples, gaining inspiration from diverse approaches to urban forest management.

3.Advantages for Cities:
Understanding the advantages of being recognized as a Tree City of the World is crucial for municipalities contemplating participation. The workshop will delve into the benefits, ranging from improved environmental resilience to enhanced community well-being.

4.Practical Application Guidance:
Municipalities interested in joining the TCOW program will receive practical guidance on the application process.

5. Evolving Recognition:
As the TCOW program evolves, the workshop will explore the latest developments and future steps.

Target Audience: This workshop is tailored for municipalities considering participation in the TCOW program, tree managers within these municipalities, and organizations dedicated to urban forestry.

Defining training needs for urban greening planning with local authorities

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ABSTRACT

The European Nature Restoration Law includes an obligation for all cities and towns over 20.000 inhabitants to develop ambitious Urban Nature Plans (previously termed Urban Greening Plans) including "measures to create biodiverse and accessible urban forests, parks and gardens; urban farms; green roofs and walls; treelined streets; urban meadows; and urban hedges" (EU Biodiversity Strategy 2030).

But do local authorities have the capacity in-house to develop and implement the Urban Nature Plans? What training needs do they have? Which capacities do they lack? What tools do towns and cities actually use to plan, design and manage urban forests and urban green? What tools do they would like to have and use?

These are the guiding questions for a workshop lead by the European Forest Institute, as part of the Horizon Europe project Urban Greening Plans plus (UGPplus, grant number 101135386).

https://networknature.eu/ugpplus

PuppetTREE: caring for veteran trees

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Meilleur, Guy | Historic Tree Care (United States of America)

ABSTRACT

People value trees, but caring for them is difficult. PuppetTREE lightens up information overload with simplified, endearing messages. When the heart is opened, the mind follows. Tree care lessons are effortlessly absorbed.

PuppetTREE's short shows feature an arborist, Dr. Treedom, caring for Trevor Tree. A variety of puppet characters - mermaids and trolls, birds and insects, people and animals - help Trevor adapt to a wide range of issues. When Basil Kutz reaches for his chain saw to resolve the issue-du-jour, Dr. Treedom points the way to less radical resolutions. Basil returns transformed: aware of reasons and methods to keep Trevor and his environment growing strong.

Each episode delivers a unique message: Green Credentials (the purpose of training), The Charismatic Carpenterworm (understanding insects & beneficial associations), Trevor and the Black Hole (managing hollow trees), Un-Girdling Roots (mulching, flare care, root collar examination, girdling root removal), "What's in a Name?" (taxonomic classification schemes), "Regenerating Trees after Storms" (inspecting damage, pruning, stabilizing), and "Challenge Courses"(support & lightning systems and wound management).

Transferring tree care technology with PuppetTREE entertains and educates with art and humor. A typical comment: "I attend many tree conferences where I hear the same information, presented the same way. PuppetTREE's sense of play, imagination, and 'boldness to try' engaged my attention. When the puppets introduced novel tree care approaches, my resistance vanished."

Informed management gives trees a chance—delivering to us their long-term benefits. But tree care is too serious to be taken seriously! The innovative ideas in PuppetTREE orient viewers to practical tree care. Engaged and energized citizens help trees adapt to the insults of civilization. Together, we can create a resilient urban forest.

How to improve urban tree biosecurity? Participatory approach to improvement of current European practice

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ABSTRACT

Urban trees, as pivotal elements of green infrastructure, are increasingly threatened by alien pests (insects and pathogens) that are introduced via trade and transport. These pests, often propelled by effects of climate change, become invasive, causing devastating environmental and economic losses. They also have negative impact on cultural values of trees, and those are proved pertinent for the public. However, current biosecurity system fails to capture alien pests. COST Action "Urban Tree Guard - Safeguarding European urban trees and forests through improved biosecurity" (UB3Guard) CA20132 works on providing responses and possible solutions to that problem. It gathers researchers and professionals from number of European countries. In the scope of the "WG3 Integration" activities, we are organizing a series of world-café workshops with stakeholders with the aim to provide EU guidelines for improvement of current tree-related biosecurity system. A workshop with Forum participants, who are of various professional background and experience, will increase the quality and relevance of the future EU guidelines.

Urban Forests for a Sustainable Tomorrow

Keynotes

Thinking like an urban forest: inspirations, insights, decisions, and results of practical forest management

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ABSTRACT

The presentation unfolds the urban forest story of a medium-sized Central European city that has undergone a unique transformation in recent decades. At the end of the 1980s, when this city was still heavily burdened by industrial pollution, it seemed that its urban forest had been forgotten by everyone: by the private owners, by the local community, by the foresters, and even by the citizens. In the mid-1990s, a group of young forest experts recognized its potential and prepared a development strategy. When the Municipality got involved, an unexpected turnaround followed.

In the next three decades, innovative approaches in legal protection and coordination of private and public interests in urban forests have been developed. Adapted forest management with an emphasis on close-to-nature silviculture has been implemented. A sort of "new forestry school" emerged, incorporating governance, participation, public relations, as well as the development of recreational and educational infrastructure, equipment, and even landmarks. The city has become renowned for its urban forests, with its residents and politicians proud of them.

The development and decisions regarding our urban forest have been often inspired by presentations and lively debates with fellow forestry practitioners, academics, and researchers for over 20 years. EFUF has thus provided a rich source of information and ideas.

Today, our urban forests are taking on new roles, from mitigating climate change and promoting human health to educating both us and the next generations on the importance and functioning of natural ecosystems.

Can we 'think' like the urban forest? For many people, it is becoming a space for deep personal immersion: to experience the forest's beauty and wisdom, and to feel gratitude for all it provides us. How enchanting it is to play music for the forest and write a poem to the tree... The story of the urban forest of Celje in Slovenia continues.

The role of the European Arboricultural Council in enhancing professionalism in tree care and management

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ABSTRACT

The European Arboricultural Council (EAC) is the network of the national professional arboricultural associations across Europe. We have been contributing to the development of the European arboricultural industry, while taking an initiative to promote the tree care community and profession. Our significant position has been recognized especially by our unique two credentials, the European Tree Worker (ETW) and the European Tree Technician (ETT), both of which are well accepted and implemented in Europe today. EAC is also responsible for the administration of the Certification of Veteran Tree Specialists (VETcert).

The path taken by EAC in its 30 years of existence and its vision for the future of arboriculture will be briefly described. The presentation will also introduce our certification schemes which were developed originally for arborists, but would be also relevant and beneficial to those working in the field of urban forestry.

Urban Forests for People and Society

Parallel talks

How Scottish Forestry innovates in community engagement in urban forests

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ABSTRACT

Scottish Forestry's community engagement programme is progressive and inclusive.

Working in partnership with community interest companies, local interest groups and volunteer community champions, Scottish Forestry continues to deliver a range of projects for a variety of audiences.

Examples of Scottish Forestry community engagement work includes:

Integration events like International Peace Day Celebrations, International Day of the Forest & Tree Dressing Parties. A broad mix of local community anchor organisations come together to mark these occasions. These gatherings in the local woodlands are places to acknowledge commonality through the sharing of food, teas, music, and crafts.

Faith celebrations: like Spring festival of Vaisakhi and Holi bring together people of faith and none, with activities celebrating the start of a new season and what the woodlands can offer, with wild food, foraging and outdoor cooking.

Bespoke Activities, such as Woodland Wheels rides and Wellbeing of the Woods Photo Walks help to engage diverse minority groups urban woodlands. The projects foster cultural integration and an appreciation of the health and environmental benefits of being active and creative in nature-based settings.

Volunteer Community Champions: Empowering community leaders through a 9-month training programme to deliver woodland activities. Walking groups, youth camping, forest kindergarten, forest bathing are some of the projects explored, with activities designed and delivered by and for the communities.

A key priority of Scottish Forestry is to engage more people, communities, and businesses, in the creation, management and use of forests and woodlands. They strive to ensure that more people benefit from Scotland's green spaces. Through close community links and inspirational programmes, Scottish Forestry helps to strengthen bonds to urban forests, encourages stewardship and builds communities who are connected through woodlands and nature.

Arboreal citizen participation: more-than-human agency in urban forest planning, design and management

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ABSTRACT

For many humans, urban forests are nature close to home. For more-than-human beings, especially urban trees, urban forests are home. Most research on inclusive urban forests and urban green spaces focuses on how we can implement distributive justice and procedural justice for human citizens, i.e. ensuring the urban forest is physically accessible and that people can participate in the citizen participation processes on their planning, design and management. However, we bestow urban trees and other more-than-human beings with very limited self-determination. What if we redefine urban trees as arboreal citizens rather than green assets – granting them a voice and a seat at the table?

This talk redefines community participation through an arboreal lens, recognising trees as part of the community and introducing the idea of place-based arboreal creative practices. Examples from practice illustrate how urban forest planning, design, management and governance can incorporate more-than-human agency.

A range of case studies and examples is introduced based on Sherry Arnstein's 'Ladder of Citizen Participation' (1969), showcasing the potential of arboreal citizen participation to support fair, healthy and resilient urban forest planning, design and management for all beings. The presentation expands on work previously presented at EFUF2023, 'Intersectional Belonging: Exploring senses of belonging for equitable access to urban forest places across communities', sharing key findings on the importance of more-than-human inclusion to ensure inclusive urban forests for all.

Effects of exposure to an urban forest in spring on the psychological response of healthy young adults

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ABSTRACT

People's contact with the natural environment, especially residents of large cities, effectively counteracts negative stress symptoms and has many positive psychological effects. Still not much is known about whether a mere stay in the forest, without engaging the senses, is as effective in human renewal as one that involves greater, more conscious activation of the senses of sight, hearing, smell. The study used the largest forest complex in Warsaw to measure the effect of this environment in the spring aspect on human psychological relaxation during passive exposure in a randomised experiment. The participants in the experiment were 19 young Polish adults. The experiment consisted of two series. In the first, participants read a text from an academic textbook for 20 minutes in a forest stand, while in the next session - which ran in the same location - they contemplated the landscape. Four psychological questionnaires (Profile of Mood State POMS); Positive and Negative Affect Scale (PANAS positive and negative); Regenerative Affect Scale (ROS); Subjective Vitality Scale (SVS) were used before the experiment and after each of the two series of 20 min exposure to the forest.The analyses showed that being in a forest environment has a positive effect on the psychological relaxation of the subjects. However, the level of benefit derived from the activation of the senses, in particular the sense of sight (looking at the forest) was significantly higher. Compared to the passive activity of reading a text, the level of positive feelings (PANAS positive), as well as the ROS restoration index for the activity of contemplating the forest landscape was statistically significantly higher. Also, the indices of four of the six POMS subscales were statistically significantly different in favour of the activity involving contemplation of the forest. The above indicates that forest bathing is the best form of relaxation that can be obtained from contact with the forest.

The impact of urban green and grey spaces on mental health: insights from the inhabitants of Rome

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ABSTRACT

This study, conducted within the framework of the Rome Longitudinal Study, explores the intricate relationship between urban greenness and mental health, offering groundbreaking insights into how different environmental elements influence mental health-related outcomes. The study distinguishes itself by employing both 2D and 3D indicators to evaluate the impact of green and grey spaces on the mental health of a substantial population-based cohort. The data set encompasses 593,894 Italian adults aged 30 years and above. The mental health outcomes were meticulously defined using two primary sources: prescription records (encompassing a range of psychiatric medications such as antidepressants, antipsychotics, mood stabilisers including lithium, and anxiolytics, hypnotics, and sedatives) and hospitalization records (specifically focusing on conditions like schizophrenia spectrum disorder, depression, anxiety, stress-related and somatoform disorders, and substance use disorders). The study's innovative approach involved the use of varied indicators of environmental exposure, including the 2D indicators (e.g. Normalized Difference Vegetation Index, NDVI) and 3D indicators derived from LiDAR data (green and grey volume, tree count, and the Normalized Difference Green-Grey Volume Index), all measured in the vicinities of the participants' residences. The conclusions drawn from this study underscore the significant impact of urban green spaces in mitigating the use of drugs for psychiatric conditions. Conversely, greater exposure to urban grey spaces is linked to an increased usage of such medications. These findings highlight the critical need for accurate characterisation and understanding of green and grey spaces within urban environments, using novel and comprehensive exposure indicators.

Tree Equity Score - A tool for climate action in cities

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ABSTRACT

The urban heat island effect can cause temperatures to reach as much as 11 deg. C warmer than surrounding rural areas. This trend is prevalent across the globe. With predicted increases in temperatures worldwide due to climate change, those increases will be multiplied, leading to potentially millions more heath related deaths by the end of this century.

Because trees are often sparse in low-income neighborhoods, neighborhoods of color, or where people need them as life-saving infrastructure the most, those populations will experience the vast majority of those health impacts.

American Forests' Tree Equity Score (treeequityscore.org) is a tool to build a movement that reverses that deadly dynamic based on a simple value: everyone, regardless of race, age, or income level, deserves to experience the benefits of trees. Tree Equity Score states the problem by synthesizing complex data into a simple number for every urban neighborhood that, in its short existence, already has begun to catalyze investment in the places that need trees the most. It is designed to be public-friendly to measure how well a neighborhood or municipality is ensuring the benefits of urban tree canopy reach every resident, particularly those susceptible to extreme heat, air pollution and other conditions.

In December 2023, American Forests teamed up with the Woodland Trust and the Centre for Sustainable Healthcare to bring Tree Equity Score to the UK (https://uk.treeequityscore.org/) and is already being used in by cities and organizations to advance Tree Equity across the country.

This presentation will demonstrate how Tree Equity Score has impacted communities in the UK and the US, sharing case studies while demonstrating the power of the tool.

Preconditions for strategic development of nature-based tourism in Canton Sarajevo: Exploring attitudes of urban forest users

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ABSTRACT

Canton Sarajevo, with its specific cultural, historical and environmental aspects, is one of the most popular tourist destinations in Bosnia and Herzegovina. Touristic visits to urban forests and forest landscapes are included in official tourism products, resulting in increased numbers of visitors as well as pressure from overcrowding. Current forest management efforts are not in line with the expectations of users leading to disputes, mismanagement and rising distrust among various stakeholders. On the other hand, tourist development is frequently profit-driven while ignoring concerns about the conservation of forest ecosystem services. Strategic development of nature-based tourism is required based on the attitudes of urban forest users, embracing forest conservation and activities consistent with sustainable tourism principles as major pillars. This paper examines the attitudes of urban forest users (n=605) towards the potential of urban forests for various types of nature-based recreation and tourism development. The research applied a mixed-methods approach combining an online and in-person survey of urban forest users and visitors to forest-protected areas near the city centre. The findings indicate that the socio-demographic profile of urban forest users varies according to the accessibility of the urban forest area and the quality of the tourism infrastructure. Respondents had consistent opinions towards the state of urban forests and the available infrastructure's capacity to support a range of nature-based recreational activities. The findings of this research can aid in the strategic development of nature-based tourism activities customised to the demands of urban forest users and the particular features of the forest landscape. Understanding the attitudes and demands of urban forest users might serve as an empirical basis for developing management guidelines for urban forests that consider nature-based tourism activities and promote sustainable tourism.

The role of cultural ecosystem services as perspective for future urban parks management: The Skopje City Park

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ABSTRACT

This research investigates the role of cultural ecosystem services in the management of urban parks management, focusing on the Skopje City Park. Recognising the crucial impact of planning, design, and multifunctional capacities in urban green spaces on human well-being, the research emphasizes the need for a comprehensive understanding of green areas functions, particularly in terms of ecosystem services. Through a literature review, the research assesses cultural ecosystem services, exemplified by perspectives from nature photographers.

The primary goal is to understand how urban dwellers perceive and value the Skopje City Park. Using 268 photographs from 61 authors on Google Earth, the analysis conducted in QGIS produces a park map identifying hotspots based on image distribution. This underscores cultural ecosystem services' significance in enhancing quality of life and human health in Skopje.

In addition to identifying hotspots, the research highlights the role of photographs in park maintenance and the understanding of the visitors' preferences and their needs. Photographs serve as valuable documentation tools, aiding park management in identifying areas of high visitors' interest and potential concerns. The research suggests that visual representations contribute to a more informed approach to maintenance strategies, aligning the park with evolving preferences and needs.

Furthermore, the research emphasizes the potential of cultural ecosystem services in fostering environmental awareness, social cohesion and interaction among Skopje's urban dwellers. The research concludes by offering recommendations for a research framework and conceptual models to inform the selection and assessment of cultural ecosystem services in future studies. This research contributes to understanding the role of urban green areas and advocates for integrating cultural ecosystem services in shaping future strategies for Skopje City Park management.

Planning for utopia? Stories of the future treescape

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ABSTRACT

The Branching Out project uses a values framework adapted from the IPBES Life Framework, to apply specifically to urban trees. The LIFE framework allows a more inclusive approach to the values of nature, but as a result contains values that are not currently represented in most western urban tree governance systems. Using a storytelling approach, we have used this framework in three cities in the UK, each with different planning history and demographics. The framework structures the values of treescapes according to four frames: Living from, Living in, Living with, and Living as. The frames are not mutually exclusive and often overlap but also allow the inclusion of non-human perspectives giving a holistic and nuanced picture which highlights opportunities and conflicts. This has enabled the establishment of an inclusive set of value indicators of both presence and quality.

Community stories are an effective way of eliciting personal perspectives, knowledge, and local context. They can highlight specific issues and give first-hand information to understand community priorities, concerns and visions.

Working with combined citizens and decision maker panels, we used timescales of 20 years (human) and 100 years (tree) to work with participants to think creatively to tell a short story about what the future treescape in their city might be like. Next, we focussed in on specific locations in the city that they would like to see change, detailing what the place would look like and why, how this change would happen and who would need to be involved. The process of engaging in these activities had immediate impact for decision makers hearing optimism and appreciation in the stories of citizens, while citizens gained insight on constraints.

These activities have generated a set of scenarios for the development of the future treescape in each city to shape local authorities' plans for tree planning, governance and management in the future.

Urban Forests for a Sustainable Tomorrow

Parallel talks

Management and maintenance issues in Leipzig's urban floodplain forest: current potentials and risks

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ABSTRACT

The city of Leipzig with more than 600,000 inhabitants is also home to one of the largest contiguous hardwood floodplain forests in a major European city. This urban forest has been recognized as an ecological jewel in numerous popular publications due to its wealth of typical floodplain plants and animals and its importance as a local recreation area. As a complex forest ecosystem, it has been and continues to be the subject of intensive scientific research and evaluation. Nature conservation associations and municipal forestry and nature conservation administrations are engaged in a debate about the best management strategy for the sustainable development of the area. The "Lebendige Luppe" project started in 2012 to compile a comprehensive data set of various ecological parameters in order to document the status and current development trends of the floodplain forest. The main concern at the project start was the problem of declining groundwater levels and the lack of flooding, which were blamed for the creeping ecological degradation of the floodplain forest. However, additional problems, risks and threats were identified and monitored that endanger the existence of the species- and structure-rich forest ecosystem. These include the lack of oak regeneration and the progressive spread of ash dieback caused by the fungus Hymenoscyphus fraxineus and the sooty bark disease, caused by the fungus Cryptostroma corticale. Systematic surveys were carried out on the project's sample plots, revealing worrying trends. For example, changes in the composition of tree species can be observed that are moving in an unfavorable direction, promoting tree species that are untypical of floodplain forests. We present selected examples and suggests initial proposals for nature-based solutions. The project also implemented initial construction measures to bring more water to the floodplain forest, which give hope for the success of intended large-scale revitalization measures in future.

The role of public participation in urban forests management

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ABSTRACT

In this paper we will reflect on the challenges of forest and green space management in the face of climate change and the role of public participation in governance, using the example of an urban forest in Ljubljana, Slovenia. Drawing on both historical and contemporary sources, we will explore why and how public participation can be of interest as a contribution to strengthening management capacities.

We will start with a look back into history and recall how, in Europe, the urban forest and the park have very often evolved from private estates that have been put into public use. We'll also look at two strong Slovenian traditions: sustainable forestry and nature conservation, both of which speak to the importance of civil society in managing urban forests. On this we will base our reflections on new models of urban forest governance, which supposed to be comprehensive and inclusive.

We will show that growing societal expectation on urban forest in the tim of climate change and other challenges requires new concepts of work organisation and the involvement of new actors in management processes. From the perspective of managers, opening up management to forest users and urban dwellers is inevitable. In practice, however, it will be necessary to have the time and the will to develop and consolidate the new concepts.

PPGIS tools in Nordic urban green space planning and management – results from NORDGREEN project

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ABSTRACT

As citizen-engagement tools, Public Participation Geographic Information Systems (PPGIS) provide opportunities to integrate local citizen knowledge into urban green space planning and management. PPGIS tools are well suited for capturing information produced by lay participants based on their own lived experiences and pertaining to the diverse uses, perceptions, values, and services associated with urban green space. In planning support, PPGIS and related place-based citizen-engagement tools present a promising approach to diversify the types of knowledge that inform green space planning and management and to involve citizens in the planning of local nature-based interventions.

With the increasing use of digital public participation tools in planning support, several open questions remain concerning their implementation and the best practices to integrate citizen-produced geographic information into planning practice. To address these questions, this presentation introduces results from NORDGREEN, a Nordic collaborative research project focusing on health and wellbeing dimensions in green space planning and management. The project explored the potential of PPGIS tools to address diverse knowledge needs related to green space planning and management in four Nordic cities. Citizen-engagement approaches employing PPGIS surveys were designed in collaboration with the partner municipalities of Espoo (Finland), Stavanger (Norway), Vilhelmina (Sweden), and Ii (Finland). The final surveys varied in scale, target population, and thematic focus, covering topics from green space use and perceived quality to potential conflicts in green space planning. This presentation summarizes key insight from these surveys to provide practical examples of how experiential place-based data collected with PPGIS methods can be integrated into the planning and management of urban green spaces and green infrastructure.

The LIFE-CLIVUT experience, a post-pandemic case study of dissemination on climate value of urban trees

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ABSTRACT

The LIFE CLIVUT (LIFE18 GIC/IT/001217) is a dissemination and communication project carried out in 4 European Pilot cities (Perugia, Bologna, Thessaloniki, and Cascais) from 2019 to 2023 to involve administrations, urban planners, citizens, and entrepreneurs in the realisation of an Urban Climate Green Asset Strategy to maximise urban green climate mitigation potential, deliver biodiversity and improving human health and wellbeing. In particular, one of the main actions was aimed at improving citizen awareness about the climate value of urban trees and directly engaging them in the management of public and private urban green spaces. While large space has been dedicated to educational activities in schools of all levels, to make younger generations conscious of their potential to adopt environmentally responsible behaviours to effectively mitigate climate change. Citizens were involved in thematic walks led by technical experts exploring urban ecosystems and involved in the census and monitoring of public green areas and their private gardens with the web- app "lifeclivut.treedb.eu". Despite delays due to Covid-19, the post-pandemic participation was wide, with a renewed pleasure in the outdoors. The lessons for the students have undergone a substantial revision compared to the modules initially designed from January to March 2020. To deal with distance learning and to not completely stop educational activities, an additional website has been created with learning tools, games related to green spaces (www.lifeclivutspringames.education), and materials to promote outdoor learning activities even when schools were closed. The school and university learning modules were redesigned as a reusable and interactive toolkit for teachers/professors available online, that could be used both in schools and in distance-learning activities. In addition, audio and video media, fact sheets, and experiments were selected to be easily reproduced in the classroom.

Using a location-based game to gather preference data for forest planning

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ABSTRACT

Location-based games using GPS technology, such as geocaching, allow players to engage in landscape-level play and have transformed the human-forest relationship. These games offer unique opportunities for collecting spatially explicit data. While these games have been used to collect mapping and modelling data, there is limited research on their use in gathering data on human preferences, opinions, and emotions. Collecting human-centred data for forest planning and greenspace decision-making processes can be resource-intensive, so using location-based games to gather data from large groups of people can be a cost-effective alternative.

This study assesses geocaching's effectiveness in collecting quantitative, qualitative, and photographic data. Surveys were embedded in geocaches placed on four trails established in forests in both urban and rural settings in Finland. These surveys collected data concerning human-forest relationships and landscape preferences across various forest types with different silvicultural treatments. The findings revealed that trails closer to urban areas with higher population densities received higher cache log volume and survey response rates, and the collected data proved suitable for analysing aspects of human-forest relationships and landscape preferences. Additionally, the study found that most information was collected in the first summer after trails were established.

It is recommended that future studies employing this methodology should focus on creating shorter, easily accessible, circular trails, and ensure that survey questions incorporate a method of verifying that submitted responses reflect experiences at the chosen location. Moreover, to successfully use location-based games in data collection, forest planning professionals and researchers are to engage with the communities that play these games. Seeking advice on community rules and regulations, maintaining regular contact and co-creation are recommended strategies.

The Mersey Forest at 30 - 1994-2024

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ABSTRACT

More Trees, More from Trees: the Mersey Forest at 30

The Mersey Forest (TMF) Plan was approved in 1994, leading to 30 years of transformative urban forestry. Adapting to evolving policies, priorities, and funding, TMF managed the ebb and flow of policy and financial support through:

• Adaptability & Partnership: TMF's "More from Trees" vision isn't static. Close collaboration with planning authorities ensured integration into local frameworks while engaging diverse stakeholders - health, education, and beyond - broadened TMF's reach and impact.

• Dedicated & Empowered Team: Skilled and passionate staff, coupled with a flexible governance structure, fostered resourcefulness and responsiveness to new funding opportunities.

• Quantifying Value: Continuous monitoring and research partnerships built a robust evidence base showcasing TMF's multifaceted benefits - environmental, social, and economic.

• Empowering Communication: Highlighting these benefits through diverse channels – from community events to policy advocacy – secured ongoing support and influenced policy at local, regional, and national levels.

The Learning for Urban Forests:

• Embrace long-term vision and adaptability. Be agile, adjust to changing realities, and keep "More from Trees" at the core.

• Forge strong, diverse partnerships. Go beyond traditional environmental actors; health, education, and communities are key allies.

• Build a robust evidence base. Quantify your impact – environmental, social, and economic – to stand on solid ground.

• Prioritize innovative funding and communication strategies. Be resourceful, leverage new funding opportunities, and tell your story in ways that resonate.
The Forest Partnership is in the process of developing its Plan to 2050 and beyond, mindful of these lessons. TMF offers one model for sustainable, impactful urban forestry that has been tested over time.

Urban Forests for All Living Beings

Parallel talks

Urban forests in multi-objective forest management planning in Slovenia

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ABSTRACT

In urban forests, multi-objective forest management should provide prevailingly public benefits to the city residents. In this context, forest planning should recognize and harmonize the needs of the local community, its residents, private owners, and other stakeholders. Important task of forest planning is preparation of professional bases on how to satisfy these needs in the frame of sustainable forest management. It seems that in many countries, the role of urban forests in the forest management planning has been neglected for different reasons. In some cases, urban forests are considered as city's green infrastructure and not included in the forest plans but in separate city plans. Next, the framework of the classical forest plans is commonly based on forestry spatial units, the context deals mainly with forestry issues (i.e., forest stands, stand development), and the legal prescriptions do not allow for a detailed analysis and consideration of problems related to urban forests. In addition, public participation in the planning process is far too limited as needed for the urban settings. Finally, the governance of urban forests is distributed among many different actors, and the role of different institutions in the planning and management is not always clear. In this paper, we present experiences with urban forest management planning in Slovenia. Recently, a more comprehensive approach towards all urban forests has been developed. The first step was the preparation of urban forest management guidelines and the comprehensive integration of the urban forestry issues in the regional forest planning system. The following activities will include the preparation of urban forest management guidelines on the operational level, the support to local communities in the preparation of legal decrees on urban forests, the elaboration of protocols for collaboration between Slovenia Forest Service and local communities, and a joint promotion of all urban forests in Slovenia.

Nature protection for all living beings – what does this mean?

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ABSTRACT

How would one manage a prestigious 320 hectares patch of forest in the middle of a city? It has been made available to all living beings, more or less intentionally, for more than a 100 years. This urban forest as a part of the Landscape park Tivoli, Rožnik and Šiška hill in the City of Ljubljana has been an integral part of an area covering 459 hectares, which has been protected since 1984. According to recent records, more than 3000 different species of organisms inhabit in the area, among them endemic, endangered and protected species, some of which depend on specific ecological conditions found only in old growth forest. At the same time, this forest is owned by more than 420 different owners and is estimated to be visited by almost two million users yearly. Namely, the entire landscape park with highly emphasized social functions integrates various forms of public and commercial services and activities, such as sports and recreation facilities, cultural and historical buildings, children playgrounds, etc. This also raises questions about its accessibility vs. keeping the natural processes intact as possible.In recent years, there have been calls for a change in governance of urban forests, from both experts and the public. But if the city and private owners have kept and managed it for so long, what has changed recently, that might require a different governance model in order to keep the area available to all living beings in the future? The awareness of climate change and biodiversity loss is no longer limited to experts from various fields working for public, private and non-governmental organizations, but it has also risen among the lay public, which demands more active involvement in the governance of urban forests and protection of nature. How has this affected the demanding management of the most visited nature protected area in Slovenia? A case of nature conservation as a tool will be presented based on recent management experiences in this park.

Would you walk through here? Urban wildscapes during utility and recreational walks

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ABSTRACT

Walking is a primary physical activity that could ensure the contact of urban inhabitants with nature, provided they walk through green surroundings. While the green surrounding of walks is predominantly linked to archetypical manicured urban parks and street greenery, there are other potential green sceneries, such as urban wildscapes. They are mainly shaped by nature and offer a sense of being in "nature" or even in the "wild". Whether city inhabitants are willing to walk through urban wildscapes and what could attract them to make such a walk has been a subject of a long-lasting debate. This study evaluates factors supporting and limiting the willingness to walk through urban wildscapes. The study was conducted using a computer-assisted web survey among N=524 green space users from Warsaw (Poland). Participants were asked to assess photomontages in order to collect data on self-reported willingness to traverse various urban wildscapes. Eighteen different urban wildscapes were evaluated as a potential green scenery for both utility and recreational walks. Random effects models hinted towards the willingness to walk through urban wildscapes being higher for recreational walks than utility walks. Scattered greenery and grasslands were preferred for utility walks. Dense greenery and forests were preferred for recreational walks. City inhabitants may benefit from the broader acceptance of walking through urban wildscapes without the costly manicurisation of "wild" green spaces. The findings are in line with the discussion on social-ecological connectivity and demonstrate that the "nature of the fourth kind" should be taken into account when planning green corridors to meet societal and environmental needs.

Tree-related microhabitats (TreMs) among large trees of five species in three old cemeteries of Karlsruhe City, Germany

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ABSTRACT

Are old cemeteries with large trees in a big city biodiversity paradise? TreMs are known as an indicator of habitat diversity, but little is known about TreMs in cemetery trees. We studied TreMs' richness and abundance in cemetery trees and their influencing factors. We surveyed large trees of five species (Acer platanoides, Carpinus betulus, Fagus sylvatica, Platanus x acerifolia, and Quercus robur) in three cemeteries established between 1594 and 1902 in Karlsruhe, Germany. The inventory was done 2023 on 200 randomly selected large trees (40 trees per species, >40cm diameter at 1.3 height or DBH). TreMs data collection is based on the hierarchical typology with 7 forms, 15 groups, and 47 types. We observed the highest TreMs in C. betulus and Q. robur trees. Whereas, TreMs richness, that was, the number of different categories of microhabitat per tree, was found to be highest in C. betulus, followed by A. platanoides and Platanus in comparison to F. sylvatica and Q. robur. The high richness of TreMs in Platanus is worth mentioning due to its immense size (the oldest Platanus trees in the region from the nineteenth century), which was not found in the younger street and park trees of Platanus by us in our older studies. We observed TreMs richness and abundance increased with tree size and reduction of crown pruning. Woodpecker holes were highest among Q. robur and Platanus trees, whereas C.betulus had the highest concavities, rot-holes, and dendrotelms. Platanus and F. sylvatica trees had the highest amount of fungi, whereas A. platanoides trees had the most epiphytes. Ordination analyses revealed that exotic Platanus trees formed different associations of TreMs than 4 native species. Old cemeteries with large trees are a paradise for habitat diversity, and they should be preserved without compromising public safety, which can be challenging task. Biodiversity monitoring and ecosystem functioning research combining multiple cities should be undertaken in cemeteries.

Diversity patterns of endophytic tree fungi on European urban-rural gradients

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ABSTRACT

In recent years it has become evident that endophytic microbiota play an important role in shaping the fitness and health of trees. These microorganism communities, living inconspicuously within trees, can be affected by various biotic and abiotic stresses, particularly those prevalent in urban environments such as air pollution, soil degradation, and habitat fragmentation. These stressors weaken trees, increasing their susceptibility to both native and non-native pathogens, thereby posing severe threats to overall tree health. Despite this understanding, a limited number of studies have explored fungal tree endophytes in urban settings, and often focus on specific tree species and small geographic scales. This research project will address this gap by examining the diversity patterns of foliar fungal endophytes in trees along urban-rural gradients across Europe. The study will focus on four widely distributed native tree species (Quercus robur, Acer pseudoplatanus, Pinus sylvestris, Picea abies) and four congeneric or confamiliar non-native tree species, employing long-read PacBio amplicon sequencing for fungal community assessments. Sampling will be conducted in up to 20 European cities, in collaboration with participants from COST-action CA20132 "Urban Tree Guard - Safeguarding European urban trees and forests through improved biosecurity". Each city will be represented by four sites along an urban-rural gradient, with data on abiotic and biotic factors (e.g., climate, tree diversity, tree stress indicators) collected at each site. The outcomes of this project will significantly enhance our understanding of the interplay between anthropogenic activities and diversity patterns of fungal endophytes of trees across a broad geographic scale. Furthermore, the study will contribute to the early detection of potentially harmful tree-associated fungi that may be present in urban areas but have not yet been observed in natural forests.

eDNA analysis revealed higher biodiversity in park trees compared to street trees and in Karlsruhe (Germany) compared to New Haven (USA) among solitary Norway Maple and Red Oak trees

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ABSTRACT

The health of our urban forests and the organisms they support is faltering with changes in global climate, species ranges, and intensifying urban environmental pressures. These conditions emphasize the importance of understanding the complex interactions that bolster healthy, biodiverse ecosystems in our cities. To understand these processes, we conducted an environmental DNA analysis using the meta-barcoding technique on leaf, bark swabs, and soil samples to detect fungi, invertebrates, and vertebrate diversity on urban trees in Karlsruhe, Germany and New Haven, USA. This was achieved through the collection of eDNA on Acer platanoides, a tree species native to central Europe, and Quercus rubra, native to the northeast United States, in Karlsruhe, Germany and New Haven, USA. 12 large trees equally comprised of both species in parks and along streets were selected in both cities for a total of 24 surveyed trees. Bird, mammal, arthropod and fungal diversity was higher in Karlsruhe, while bacterial diversity was higher in New Haven. In Karlsruhe, differences in organismic diversity vary greatly between parks — where biodiversity is higher — compared to street trees. In New Haven, organismic diversity is determined more by species of the solitary tree, where diversity is higher at the native Quercus rubra. The analyses of organismic diversity between native and exotic tree species will provide a full biological profile to assess the enemy release hypothesis in these environments. The PcoAs generally reveal distinct taxonomic groups between cities and sampling substrates. Our cross-continental approach will further insights into how differences in tree native status influence urban biodiversity at the tree and ecosystem level.

Exploring opportunities to plant for roadside air quality in the London Borough of Tower Hamlets

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ABSTRACT

The London Borough of Tower Hamlets Air Quality Action Plan (2022-2027) sets out Tower Hamlets Council's aspiration to improve local air quality. The Plan recognises that it can be difficult to quantify the benefit of the introduction of new vegetation on air quality, but that green infrastructure can help to mitigate poor air quality on a local scale if designed and implemented well. With this in mind Trees for Cities has set out to strategically explore opportunities for future roadside planting in the borough which could be targeted to achieve the greatest impact in reducing reduce people's exposure to poor roadside air quality.

This analysis is based on AFFORE3ST (Advancing a planning Framework FOr Regionally Enhanced & Equitable Ecosystem Services from urban Treescapes), a tripartite knowledge-exchange collaboration between Principal Investigator Dr James Levine (JL), host partner Trees for Cities (TfC), and technical training partner UK Centre for Ecology and Hydrology (UKCEH). It has been produced in collaboration with Treeconomics, who conducted priority hotspot and feasibility mapping to underpin the analysis.

Through this work, we have been able to identify a small number of sites across the borough which could be suitable for introducing new vegetation to improve roadside air quality. Based on a set of principles for the design of these interventions, we have created illustrative examples of how the identified sites could be designed to create attractive and usable spaces which offer multuple benefits including air quality improvement. In addition, we have explored the limitations and opportunities in relation to the use of vegetation as a solution to air quality-related issues, especially in these kinds of dense urban settings.

Nature based solutions and urban orchards in Zagreb

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ABSTRACT

The City of Zagreb is implementing interventions using nature based solutions as a new concept - a systemic consolidation of existing and new principlese, realized within proGIreg, a project funded by Horizon 2020 programme.

ProGIreg has introduced NBS into the regulative. In course of the project several NBS were implemented, with public participation, including the innovative therapeutic garden and modular urban farm.

Another EU project, CoFarm4Cities, is funding a pilot site of an urban orchard-second one in Zagreb - as a new concept of urban park architecture. The orchard will be located next to an elementary school in the suburbs, and it will be a test site for participation, education and conservation of heritage fruit trees.

Stakeholder knowledge of tree pests and pathogens and their management in urban areas

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ABSTRACT

Urban trees and forests provide a multitude of benefits to the urban environment and are vital for climate change adaptation. Yet, they are increasingly threatened by insect pests and pathogens, hereafter tree pests. There is little evidence on the awareness and knowledge of different urban stakeholders of this growing threat, nor on how they are affected by tree pests or how they might respond to it. To fill this gap, we undertook an online survey of different key stakeholder groups associated with urban trees and forests in Germany. A majority of 75.8% of the 186 respondents consider urban tree pests a serious problem and 51.1% reported high knowledge of tree pests. There was a particular lack of knowledge of certain quarantine pests (e.g., canker stain of plane, emerald ash borer, Xylella) and pest management responses (e.g., manual treatment methods and tree diversification). Respondents were most affected by the horse chestnut leafminer (61.3%), ash dieback (58.1%) and oak processionary moth (50.0%). The most widely used pest remedial measures were improvements of tree living conditions (60.8%) and purchases of plants from certified or trusted local sources (59.7%). Multiple correspondence analysis showed a significant association between levels of knowledge of tree pests and pest management responses (11.7%). Our results suggest that future efforts' to improve urban tree health should to be enhanced and tailored to the different requirements of a broad range of stakeholder groups. The findings will inform the development of future tree health related activities that prevent or reduce spread of tree pests.

Urban Forestry Advances – A Global Journey

Parallel talks

The urban forests of Iceland

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ABSTRACT

With the global urban population constantly rising and the threat from climate change increasing, the importance of incorporating green infrastructure and nature-based solutions within our urban environments is becoming ever more vital. If you were to ask an Icelander about trees, many people's minds would conjure up images of either birch or coniferous forests located within peri–urban or rural areas. In reality, the trees Icelanders come in contact with the most are the ones located within the parks, gardens and streets of Iceland. This is because Iceland finds itself to not only hold one of the lowest percentage of forest coverage in Europe being 2%, but to also have one of the highest proportion of its citizens living within urban areas at 94%, of this 63% live within the capital region and 36% live within the capital Reykjavik. Within such an urbanized population the importance of the urban forest and the benefits it provides is further heightened. Unfortunately, it does not take long to realise that the current literature available gives us a limited understanding of the urban forest structures located within the towns and cities around Iceland. To address these gaps in data, research has been conducted in a variety of ways, from desktop tree canopy cover assessments of the urban areas around Iceland, to a i-Tree Eco plot sample study of Reykjavik. In this presentation, I will delve into the results of this research which has been conducted since 2021. What exactly the Icelandic urban forest looks like, the threats it faces and the possibilities to learn so we can avoid the mistakes previously made by others.

Parco Italia

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ABSTRACT

Parco Italia is an Italian nationwide afforestation and reforestation program in urban, periurban and extra-urban areas, that aims to gradually establish a national ecological network, connecting protected areas, national and regional parks, marine protected areas, and Natura 2000 sites using pedestrian and cycling trails. With the establishment and systematic development of trails (such as the Sentiero Italia, promoted by the Italian Alpine Club and Itinerari a piedi promoted by the Italian Touring Club), alongside with the expansion of restored buffer areas around the paths, villages that are facing abandonment or semi-abandonment could become “Capitals of Biodiversity”, outposts across the entire territory, enabling the monitoring and sustainable management of forests, while re-activating local economies through slow mobility and ecotourism.

To narrow down the potential areas of interventions, priorities for afforestation have been identified through a nationwide spatial assessment to determine areas where forest restoration and tree planting are most urgently needed, as well as conducting a multicriteria analysis of various natural and societal factors that can be addressed through the interventions.

Parco Italia could thus serve as a pilot project and be applied in other climate regions and countries, to identify afforestation priorities areas, complementing social needs, ecological values, with adaptation and mitigation goals, enabling the necessary restoration measures to address future challenges, help address the abandonment of small towns and cities in inland areas, and ultimately strengthen biodiversity and increase the movement of individuals, which contributes to the dispersal, migration, and gene flow of animal and plant species.

Garden trees as an urban forest: Time series changes in species composition and canopy cover in Tokyo's residential suburbs

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ABSTRACT

Residential garden trees are one of the essential components of urban forestry, having a solid presence as the tree canopy in cities. Garden trees not only contribute to the well-being of individuals but also provide a variety of ecosystem services to the public, including habitat provision for birds, mitigating microclimate, rainwater infiltration, and improvement of scenic beauty. However, since garden trees exist in private properties, it is challenging to ensure their permanence, and their quantity and quality change depending on individual preference. In our presentation, using Tokyo suburbs as a case, we first provide an overview of the history of suburban residential areas and their garden formation. Next, we introduce our empirical research on the changes in tree species composition and canopy cover in a selected Tokyo suburb by different development periods: the 1970s, 80s, 90s, and 2000s. The result shows that the tree species composition is changing from Japanese native to exotic species and that the canopy area and number of species have decreased since their peak in the 1980s. In particular, we emphasize that gardens in the 2000s had a small planting base and a limited tree canopy, and this trend continues today. In Tokyo suburbs, the area of individual gardens has been shrinking as land prices rise, and individuals' interest in trees may be waning. It is necessary to consider landscape designs that maximize ecosystem services even with limited area and budget, and implement them by mutual collaboration among industry, government, and academia to improve our "ordinary gardens" for sustaining urban forestry.

Antipodean insights: successes, shortcomings, and future challenges of urban forests in Aotearoa New Zealand

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ABSTRACT

Aotearoa New Zealand is globally heralded for its clean, green, iconic land- and city-scapes, but it faces it's own challenges in establishing and maintaining effective urban forests. Following the ground-breaking Urban Forest Futures symposium in New Zealand, this talk will summarise both the successes and the issues raised by researchers, arborists, council workers, indigenous peoples, and urban planners. All sharing a common-goal, these stakeholders aim to improve our urban forest initiatives, but face hurdles when integrating across disciplines and being stone-walled by existing policy, or the absence of effective policies. Christchurch (the Garden City) is one exemplary case study of trying to incorporate urban forests into their future expansion plans. The Christchurch urban forest plan has ambitious goals to drastically increase canopy cover on both public and private land. Moreover, the resilience and intuition of Christchurch residents after the devastating 2010/11 earthquakes helped turn unstable land into a thriving green space. However, an additional consideration in New Zealand (and many other countries) is the incorporation of indigenous knowledge and indigenous peoples in the establishment and maintenance of urban forests. While New Zealand has not perfected this process, we have begun to understand the importance of acknowledging and embracing indigenous peoples' inputs and expertise to improve urban forest outcomes. In New Zealand, this is partly in the form of mātauranga Māori (Māori knowledge) passed down through their whakapapa (genealogy) and their kaitiakitanga values (guardianship of the sky, sea, and land). We attempt to synthesise all of these points in hopes of providing guidance to budding urban forest initiatives, and to receive international input on the challenges we face in the future.

A shapshot of urban forestry in Eastern Australia

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ABSTRACT

More than 85% of Australians live in cities, which are becoming hotter under climate change. The number of record hot days in Australia has doubled in the last 60 years, and heatwaves are becoming hotter, lasting longer and happening more frequently. For example, during a 2020 heatwave, Penrith in Greater Sydney's far west, reached 48.9°C. This was the hottest day ever recorded in Greater Sydney, and the hottest place on earth that day.

Of Australian cities, Sydney and Melbourne experience most of Australia's population growth. A lot of the of the urban residential growth in these cities takes place at the fringes, away from the cooling influence of the coast, and close to, if not within, these areas of extreme heat.

In accommodating growth in these large cities, greening has been a lower priority. This has implications for liveability, because suburbs struggle to provide the space required for greening for resident health and wellbeing. For example, many Australian local governments have ambitious targets for canopy cover increase but limited private space and contested public space to place additional canopy.

Mosaic Insights operates in this urban context, creating strategic advice around urban forestry at a local and state government level on Australia's east coast. We will take you through some examples of our work in this space, aiding in greening inclusion within our constantly growing and urbanizing cities.

These examples include:

•The NSW Greener Neighborhoods Guide – wholistic guidance for local government urban forest management and governance (in partnership with treeiQ)

•Canopy Inclusion in a new master planned estates – mechanisms for including canopy in a space-restricted and policy-limiting environment

•Banyule Urban Forest Strategy – working with councils to meet their conditions on the ground

Mosaic Insights is a strategy, planning and design practice. We use our evidence-based, human-centred approach to create healthy social landscapes.

Examining the value of Green Infrastructure as a delivery mechanism for sustainable East and South-East Asian cities

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ABSTRACT

Cities in East and South-East Asian cities are characterised by change. Urban development, decline, and regeneration provide prominent visual remainders of the complexity of effectively managing growth in a sustainable way. Moreover, the role of ecological resources within this discussion is often downplayed as something nice to have once housing and transport infrastructure has been provided. However, via an examination of green infrastructure planning in the region we can identify the potential of alternative socio-cultural, economic and ecological perspectives to be aligned in decision-making for greener futures.

Based on evaluations of green infrastructure planning within urban development in China, Hong Kong, Japan, Singapore and South Korea the paper examines the influence of politics, urban greening cultures, and economic change as critical factors shaping urban sustainability. By reflecting on the links between historic practices, established development praxis and contemporary approaches to investment the paper proposes a novel framework for developing green infrastructure in the region.

The paper concludes that although urban greening in China, Hong Kong, Japan, Singapore and South Korea are contextually nuanced that they share common development and management characteristics. In turn this suggests that aligning green infrastructure principles with regeneration and technological innovation can lead to development that is more reactive to climate, economic and demographic change.

Calculating the 3-30-300-rule globally: lessons learned

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ABSTRACT

Calculating the 3-30-300-rule is not easy to do, but we have been doing this for the last three years for The Netherlands at a country level. Recently we have embarked on a journey to run these processes at a global scale. The biggest challenge at this is a definition challenge: what constitutes a “high-class urban green space” to calculate the 300-rule to? With a lot of experimentation, we think we came up with a workable solution, and as a result we can now calculate the 3-30-300-rule globally and annually. In this presentation we will demonstrate the approach, the results, the applications, and the lessons learned for this data resource.

Urban Forestry for All Living Beings

Keynotes

Consultation, indoctrination or manipulation?

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ABSTRACT

he title of this session is 'An Urban Forest for All Living Things' a commendable title but is even this apparently innocent title loaded and already skewed in a certain way? This talk will explore the concept of consultation which is seen as the bedrock of sustainable urban forest management and planning. It will ask the question 'Are the consultations we initiate and facilitate really consultations - or are they, more often than not, well intentioned exercises in steering the consultees in a desired direction?'

Drawing on personal experience, and using authentic examples of people's perceptions of trees – expressed in cartoon form, Keith Sacre will suggest that consultations often only include those whose opinion is supportive of the consultation subject, those in authority with a vested interest, those who have a particular single issue to pursue and others whose general opinions are in support of trees in the urban environment.

The talk will also look at the use of language, and how the use of words such as 'educate' imply a hierarchy where the facilitators of the consultation 'know more' than attendees.

Finally the talk will suggest that an Urban Forest for All Living Things will only be achieved if there is a demand from communities themselves – not those who have 'been educated' but communities who have been genuinely consulted. People need the chance to discover for themselves, the types of places in which they would like to live, work and play, without the often myopic, one directional guidance portrayed as consultation.

Biocities: forest-based solutions transforming urban living

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ABSTRACT

Increasing environmental and health problems are illuminated by a planetary crisis of climate change and habitat depletion. Urban development and management is key for contributing to this environmental and social crisis but should also be part of the solution. A new way of inhabiting the planet should be imagined by rethinking the relationship with the natural sphere. The task is not just to increase the presence of urban forests, trees, and greenery within cities, although this is important for liveability; there are also deep changes necessary in the socio-economic, cultural, natural, institutional, and technological spheres.

The European Forest Institute has put forward the vision of BioCity, as a paradigm change, focused on identifying solutions to climate and health crises by mimicking natural systems, rather than let cities being the cause of these problems due to historically exceptional urban development. BioCities are cities that follow the principles of natural ecosystems to promote life while contributing to the solutions of environmental crises and global climate change. Therefore, BioCities are cities that strive to approximate ecosystem's functioning, particularly their network interactions such as the harnessing and flow of renewable energy, the storage of carbon, the cycling of biomaterials or other matter, and the conservation of evolutionary information as biodiversity at all scales.

A policy framework to favour a more sustainable planning and management of urban areas, as proposed by our Biocity facility, should act with a cross sectorial approach as this will interlink with different policy and legislation measures including climate change mitigation and adaptation, biodiversity conservation, transportation, energy, and construction industry. All these interact and affect nature and forests in cities and bioregions.

The Biocity facility will be presented at the Conference as well as the ongoing research projects, communication activities and initiatives with stakeholders and policy makers, at national and international levels.

Trees, planning and construction

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ABSTRACT

Trees, Planning and Construction is both challenging and changing. It is a major part of an Urban Foresters Role in the United Kingdom, and the main area of work for the author. In the UK, the British Standard (BS) 5837 'Trees in relation to design, demolition and construction. Recommendations' was instrumental to how we, as Urban Foresters, are perceived. It drove employment, created innovation in surveying, reporting and products to deliver tree friendly construction solutions; but have things stagnated? There is tension between political showcasing for tree planting numbers and Local Government cuts in the UK affecting resources. Anecdotally, Urban Forestry consultants seem less satisfied with their work in planning and construction. There is still a wide disparity in UK planning departments' expectations, policies and planning conditions, and the quality of Arboricultural Impact Assessments and Method Statements. Recent international polls show that not all of us regularly visit construction sites to see if the trees that have been retained are being appropriately protected and managed. Do we, and allied professions, need to listen and share ideas with each other more to ensure sustainable urban forestry as part of new development?

The author will share her 30 years of experience of working with trees and planning, providing practical insights on the following:

What makes a suitable tree survey
How do we, as Urban Foresters, fit into the wider picture of sustainable urban development
What information is the most useful in an Arboricultural report at early stages of development to ensure maximum appropriate tree retention and sufficient room for new planting
Becoming a #tree influencer within a wider team to ensure a more sustainable development with trees as an integral part of place making, climate mitigation and ecosystem service provision
Practical advice based on personal case studies of development from conception, planning, team working, demo

Urban Forests for People and Society

Parallel talks

Inside Zagreb's city districts – the distance and distribution of urban green space influence its perception and use

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ABSTRACT

Urban green space (UGS) provides many benefits to the urban population, so its presence in cities is essential for human well-being. Trees are pivotal building blocks of the UGS due to the provision of ecosystem services and benefits. It is important to understand how the members of the public perceive and use UGS as input for future UGS planning and management.

Public Participation Geographic Information System (PPGIS) is a tool that allows spatially explicit exploration of the perception and use of UGS. An online PPGIS survey (MyDynamicCity Zagreb) was developed and conducted to explore citizens' perceptions and use of UGS in Zagreb, Croatia. Respondents (N=384) provided more than 5,500 spatial points for analysis.

Spatial points collected represented attributes of cultural ecosystem services, disservices, and data on the approximate home location of respondents. This together allowed measuring and exploring the distances respondents cross to reach certain UGS and their perception of those UGS. Significant differences were found for distances that respondents crossed for each perception or use, where Hiking, Watching Nature, Naturalness and Education were mapped the furthest (median value > 4,000 m), while negative perception and everyday recreational activities were mapped the closest (median value ~ 2,000 m) to respondent's home. Results indicate that citizens are pragmatic and use UGS close to their homes regardless of negative perceptions. Addressing the reasons for negative perceptions can improve their recreational experience and well-being. Perception and use of UGS varied based on types of UGS. Spatial analysis on the city level discovered differences between city districts regarding access to UGS and highlighted critical locations where new UGS is needed.

Results help refine local UGS planning and management strategies with users' input and add to general knowledge about human-nature relationships in urban areas.

Variation in citizens' perception of cultural ecosystem services from urban green spaces in the Orient and Occident: a case study from Karlsruhe (Germany) and Suwon (Korea)

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ABSTRACT

Urban green spaces play a crucial role in enhancing human well-being, by providing cultural ecosystem services that positively impact physical and mental health. However, measuring these services poses a challenge when comparing them across oriental and occidental countries due to their subjectivity and cultural differences. We hypothesized that public perceptions towards cultural ecosystem services from urban green spaces in two cities with similar climatic conditions and economic backgrounds; Karlsruhe, Germany, and Suwon, Republic of Korea will vary because of cultural and religious juxtapositions. A map-based online questionnaire was conducted using the Maptionnaire platform from July to September 2023, available in German, English, and Korean. The spatial distributions of cultural ecosystem services were visualized to facilitate a better understanding. In Karlsruhe, residents mainly preferred green spaces centered around the city Palace, while in Suwon, preferences were more dispersed. Analyzing the survey results revealed that parks were the most preferred green spaces in both cities, while residents visited green spaces primarily for recreation in Karlsruhe, whereas residents of Suwon visited more for health reasons. Moreover, variations in public perceptions and usages were observed between the two cities and within different socio-economic backgrounds. For example, people living less than 300m from their favorite green spaces visited them more often, but people living more than 1km from green spaces spent longer durations during each visit. This study partially supports the hypothesis that there are variations in public perceptions between the two cities. Moreover, it provides valuable insights for future urban green space management, highlighting the importance of adjusting strategies to local needs while embracing universal values to create inclusive, equitable, and resilient urban environments.

Unfolding the relationship of urban tree species diversity to the subjective well-being of the population - A map-based survey in the urban area of Karlsruhe (South-West Germany)

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ABSTRACT

Green spaces and trees are key for enhancing well-being. Especially in urban areas with limited greenery, urbanization, and climate change pose numerous health challenges to individuals. Despite recognizing the significance of green spaces, the role of urban biodiversity in shaping well-being remains poorly understood, prompting a comprehensive exploration of both positive and negative impacts.

This study focuses on the interplay between tree species diversity, urban biodiversity, and the subjective well-being of urban residents in Karlsruhe, Germany. Considering socio-demographic factors and biodiversity-related concerns, a map-based online questionnaire involving 302 participants investigates preferred well-being locations and perceptions of biodiversity through presented images.

Results show a clear preference for green spaces in the built-up urban environment, with participants distinguishing between locations with low and high tree species diversity. We found no significant relations of subjective well-being and measured tree species diversity at indicated locations. However, there was a significant relation of subjective well-being and perceived tree species diversity. Participants with high environmental concerns demonstrate a strong correlation with a perceived high level of biodiversity but not with perceived tree species diversity.

The study shows that perceived tree species diversity emerges as a more influential factor in shaping well-being than actual diversity. Simultaneously, environmental concern plays an essential role in selecting locations perceived to possess high biodiversity. This research highlights the intricate relationship between urban biodiversity and well-being, emphasizing the need to consider subjective perceptions in urban planning and green space management strategies.

Covid and post-covid recreational impacts - perceptions of land managers in the Vienna metropolitan region

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ABSTRACT

The continuing strong population growth in the Vienna metropolitan region and the corona virus pandemic have further increased the recreational pressure on green spaces in the Vienna metropolitan region. The study "Visitor Management in the Vienna Agglomeration Area", funded by the Association Vienna - Lower Austria - Joint Development Areas, investigated how land managers and stakeholders perceive the impact of the Covid-19 pandemic on recreational areas and what aftereffects the pandemic still has today. Thirty-two land managers and stakeholders in the Vienna metropolitan region were interviewed using semi-structured interviews in 2023. The results show that the increased recreational pressure has led to or intensified many conflicts. Urban and peri-urban recreation areas in particular are at or beyond their capacity limits. During the Covid-19 pandemic, conflicts were increasingly observed between the various recreational activities themselves, but also between agriculture, forestry, nature conservation, and hunting. In particular, cycling and e-biking have experienced a boom, but an increasing number of dog walkers have also been observed. To date, recreational pressure is considered to be higher than before the Covid-19 pandemic. The interviews revealed the need for visitor management at the level of the urban-rural region. To achieve this, however, it is necessary to develop politically agreed instruments - such as a binding master plan for the management of recreational use in the metropolitan region. There is a need to collect basic data on recreational use, create platforms for exchange, establish a responsible body for managing recreation use at metropolitan level, and identify funding opportunities.

Forestami: mapping urban green spaces for wellbeing

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ABSTRACT

The importance of urban green spaces for human health is widely recognized for their direct and indirect benefits on psychophysical well-being and the environment. They contribute to decreasing levels of a sedentary lifestyle, mitigating stress levels, improving air quality and reducing temperatures.

In this context, one of the most critical challenges for urban areas concerns identifying the distribution of open spaces to guarantee social equity and environmental justice for all citizens, especially fragile ones. The paper describes the research activities in the Metropolitan area of Milan, in the larger framework of the project Forestami, started in 2018 by the Polytechnic of Milan, intending to plant 3 million trees in the Metropolitan Area of Milan.

The research has focused on defining the “open spaces map” considering the geography of “formal” green spaces, such as parks and gardens, and “informal” ones characterized by spontaneous uses, such as woods and wooded agricultural areas, using different databases in an integrated approach. All these spaces contribute to people's well-being as they have specific characteristics, but for this map only areas greater than 0.5 ha, hosting a tree canopy of at least 20%, and being actively frequented by citizens have been considered.

Starting from this urban green spaces' classification, the research group has defined the “accessibility map”. It shows and describes open spaces that contribute to psychophysical well-being and determines their actual accessibility within 300 mt to identify fragile territories in the study area, which is pivotal to intervening with new green increase projects.

This is a key element to direct the planning choices of afforestation projects financed by Forestami, working on vulnerable territories. The proposed work fits into a broader framework, supporting public bodies and administration decision-making to improve awareness of the benefits of greenery and reduce health disparities.

Thrive in the Forest - highlighting the role of urban forests as key infrastructure in education policy

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ABSTRACT

The Mersey Forest (TMF) is one of England's largest Community Forests (covering over 1370 square miles) and is both a defined place and longstanding delivery partnership.

The Forest covers Merseyside and North Cheshire, areas which see some of the highest social deprivation, educational and health inequalities in the UK. The Partnership, established over the past 25 years, is made up of community groups, landowners, local authorities, businesses, and local people and is led by the Mersey Forest team. It is through this Partnership working that the Mersey Forest has been created, with over 9 million trees planted so far (in networks of community woodlands).

Many of these new woodlands have been planted in partnership with and within walking distance of local schools enabling us to build up long term and trusted relationships with schools and landowners.

The "Thrive in the Forest" project was developed to work with 24 schools and over 2500 pupils in areas of high IMD scores.

Our delivery model utilised the trees and woodlands close by to schools or within the school grounds, offering easy, regular and progressive access. It was designed to help sustain the use of the Community Forest by schools beyond the end of the project by meeting with school need, building capacity within schools to continue delivery, reducing barriers and promoting a whole school approach to outdoor learning.

Our contribution will reflect the learning from the project, and includes case studies and insight, recommendations and ambitions but perhaps most importantly, it will highlight the need for policy across all level of government to recognise the benefits that learning in and through nature can have on educational and health outcomes for children, their families and their teachers.

Urban trees and pedestrian thermal comfort: the relative contributions of shade and transpiration

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ABSTRACT

Expanding and enriching urban forests is increasingly seen as the most feasible strategy for cooling overheated cities. Street trees and public green spaces can reduce thermal stress and facilitate pedestrian activity, making urban districts more walkable and less reliant on energy-intensive indoor spaces and vehicles. However the cooling mechanisms which are actually responsible for improving pedestrian comfort are not necessarily understood, particularly the relative contributions of leaf transpiration and shading.

In our experimental research, we examined the influence of radiation and transpiration on the canopy temperature of urban trees in a hot-arid climate, from the viewpoint of microclimatic modification and pedestrian thermal stress. Our main objective was to identify, through controlled observations in an outdoor urban setting, the role of a) cumulative shading by multiple layers of leaves, and b) the cooling induced by stomatal conductance and transpiration. Systematic measurements were conducted to simultaneously compare these regulating effects under conditions of water stress, in which leaf transpiration was negligible, and under control conditions of full transpiration ensured by regular irrigation. We found that the radiative temperature of leaves on the underside of urban tree canopies is mainly regulated by the cumulative shading effect of the multiple leaf layers above, and to a lesser extent by their rate of transpiration. These findings have important implications for the design and maintenance of urban green spaces, especially as ongoing local and regional climate trends cause many cities to become both hotter and drier. By considering the ways in which we can use shade trees to moderate pedestrian thermal stress, and at the same time conserve precious water resources, we can envision a path towards greater urban resilience and an enhanced quality of urban life.

Urban Forests for a Sustainable Tomorrow

Parallel talks

The role of organisational structure and adaptive management in co-governing urban forests - The case of a co-governance arrangement in Norway

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ABSTRACT

Green space management is inherently dealing with conflicting demands from society, multiple responsibilities for space, and a general lack of resources. In Norway, public open space management relies to a large degree on volunteering in the operational maintenance of spaces.

To gain a deeper understanding of how local governments manage and maintain green spaces, we focus on the actions taken by a green space manager answering the question: What are the actions taken in managing and maintaining green spaces? We applied the Policy Arrangement Approach focusing on the discourses taken, the actors involved, the formal and informal rules, and the resources used. In a single case study of an urban forest in a small Norwegian municipality, we explore the co-management arrangement, the organizational structures, and the role of the public manager.

Based on the stories told, we found that the motivation to actively change a public space is rooted in childhood memories and bonds to place. However, the long-term keeping of space is inevitably connected to the public organizational structure and the adaptive role of the green space manager. From providing both social and ecological expertise as a facilitator for the initiative of the volunteers to actively seeking out cross-sectoral collaborations and utilizing knowledge of people within the organizational structure.

Priorities and innovation in urban and rural municipal forests: pilot case Germany

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ABSTRACT

Municipalities (city/town plus "Gemeinde") own 19% of the total forest area in Germany. They belong, together with the federal/state forest, to the category of public ownership. The public forest is legally obliged to the public goals and municipal forest owes its particular role to the close relation of municipal citizens to "their forest". In order to reveal the priorities in the practice of managing municipal forests a survey of 50 municipalities was conducted in 2020/2021. A standardized questionnaire was developed on the basis of a theory-based 3L Model, which is designed for a comprehensive evaluation of public forest organizations. The results form a German pilot case show that all municipalities keep their forest stands sustainable. Urban municipalities are more oriented toward public good provision (recreation in the first place) whereas rural municipalities still focus on traditional market goods (timber). The chances for innovation toward new forest goods remain often unused, and there is a high variation in economic aspects like technical efficiency and profits.

Social acceptance of the management of public urban green spaces: a comparative analysis between Romania and Türkiye

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ABSTRACT

Recently, the role of public urban green spaces (UGSs) for well-functioning and livable cities has been widely recognized by the policy makers and citizens. UGSs play a pivotal role in supporting everyday life as-well-as in the conservation of urban biodiversity and the maintenance of the environmental quality of cities. To understand whether UGSs are accessible, safe and of high quality, monitoring based on citizens' opinions and perceptions is a necessary starting point. The objective of this study is to investigate citizens' perception and acceptance towards the ordinary and extraordinary management of UGSs in two countries (Romani and Türkiye). For this purpose, a questionnaire survey was administered online to a sample of Romanian and Turkish respondents (153 total respondents). The results show that citizens of both countries attend UGSs almost every day or weekly, and that after the COVID-19 pandemic the attendance of public UGSs has increased. Furthermore, the results highlight that the perceived importance towards the ecosystem services (e.g., bioenergy production from wood pruning residues, cooling effect and provision of shade in summer time, improvement of aesthetic value) provided by the UGSs is closely correlated with their attendance by users. In addition, the results highlight that our sample of respondents has a conservative perspective (first treat a diseased tree and only then remove it) on trees and vegetation in urban areas, while they consider deadwood (lying deadwood and dead branches) a component to be removed from UGSs for safety and ecological reasons. The data provided by the present study can be considered preliminary results to understand social acceptance towards the management of public UGSs.

Urban forest canopy cover goals – an exploration of current practices

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ABSTRACT

Tree canopy cover (TCC) is commonly used to describe the amount and horizontal distribution of urban forest canopy within a given city. Tree canopy cover is a useful, but imperfect metric that is easily understood by various stakeholders, including government, urban foresters, arborists, planners, urban designers, and developers.

Because tree canopy cover has been linked with ecosystem service provision and benefits for local communities, numerous cities around the world have set targets to increase their urban forest canopy cover. However, these global TCC targets largely appear to be aspirational, rather than being justifiably informed by current research. This presentation addresses the topic of urban forest canopy cover targets and is informed by an exploration of urban forest plans and strategies from around the world.

Research no longer supports a universal tree canopy cover recommendation. Instead, different canopy cover targets should be tailored to individual cities, based on local context. The international literature also shows that some cities are moving away from setting a single, city-wide, target, opting instead for different targets across electoral wards, local boards, neighbourhoods, or land uses. It is also noted that targets do not preclude cities from aspiring to greater canopy cover, though overly-ambitious targets may be unachievable and undesirable for a variety of reasons. This presentation will conclude with recommendations for cities to successfully set and meet canopy cover targets.

Creating a 100-year management plan for a UNESCO world heritage site

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ABSTRACT

One of the few UNESCO world heritage cemeteries in the world exists in Stockholm, Sweden. The whole cemetery is designed in close connection to individual trees and the forest growing within the cemetery's boundaries.

Even though this cemetery gets the highest of attention from managers, the Swedish UNESCO counsel and many more, the cemetery faces sever challenges. Some of the most iconic parts of the cemetery consists of elms, which are threatened by Dutch elm disease, the large pine forest is showing severe decline due to a combination of pathogens, stress and suspected root damages, and the spruce are being devastated by insects. Thise, and many more issues, have led to criticism on how the cemetery administration is handling this important UNESCO world heritage.

The cemetery administration has therefor ordered a full review of the past and current management, and the creation of a whole new management plan for the next 100 years.

To be able to create this long-term management plan differently aspects of the cemeteries trees has been included. This includes:

- Full inventory of all trees, including identification of all pests
- DNA-testing of a sample of the pine trees to analyze if genetic differences might affect the pines susceptibility to different pests.
- LiDAR analysis of tree canopy change.
- Historical analysis of original drawings and plans.
- Soil analysis, including removal of whole root system to assess root damages.

Based on this data, a new management plan, encompassing the next 100 years was developed. This presentation includes a presentation of the new management plan, and the many challenges that we faced in the development of this new management plan.

Assessment of the urban green infrastructure transformation, biodiversity and the value of ecosystem services for sustainable urban development in Germany and Ukraine

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ABSTRACT

Urbanization, air pollution and the state of the green infrastructure of cities are strongly linked and influence the ability of GI to provide ecosystem services. The interdisciplinary approach for spatial and statistical analysis of the relationship between the criteria of urbanization and ecosystem services is important for the formation of a better management policy of green urbun spaces for the sustainable development, biodiversity conservation and also to facilitate forecasts of the health of ecosystems.

The conservation of urban GI (Park ecosystems) to provide ecosystem services in the context of increasing urbanization is essential for the achievement of the Sustainable Development Goals. The degradation of urban GI is exacerbated by global climate change processes and poor urban air quality. To develop effective land use, sustainable urban development and infrastructure management policies, it is crucial to quantify the impact of urbanization on the condition and viability of the GI, biodiversity and ecosystem services they provide, including the influence of local conditions related to the size of cities, height of buildings, features of the relief and microclimate. GI provide unique ecosystem services for the conservation of biodiversity and ecosystems in cities, ensuring landscape continuity, air purification, improving human health, stabilising urban ecosystems, and have the greatest potential for adaptation to and mitigation of climate change.

Ukrainian cities are currently particularly affected by the war and significant internal migration. Interdisciplinary research for biodiversity conservation, management policy-making and global sustainable development in comparison with EU management policies and in Ukraine in the context of military operations and internal migration will help to take risks into account in time, preserve biodiversity and ecosystems, and respond effectively and plan for the care of GI.

Urban Forestry and Urban Agriculture synergies: from Food Forests to Edible Cities

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ABSTRACT

In recent years there has been increasing interest in both urban forestry (UF) and urban agriculture (UA) to deliver multifunctional ecosystem service benefits. Significantly, the crosscutting outputs of both these disciplines have not been fully incorporated into European policy and practice. Both UA and UF offer many similar and overlapping benefits, but little synergy exists between the two fields in terms of research or approaches to implementation. This is despite the fact that both UF and UA form key components of Green Infrastructure (GI) and Urban Greening Plans (UGP) at City and City Regional scale. Whilst there has been a clear historical disconnect between urban forestry and urban agriculture, recent typologies start to make connections and to identify urban agroforestry and food forests as also being forms of urban agriculture. A new typology of UA, produced by the European Forum on Urban Agriculture (EFUA), identified six categories of UA including "Community Parks" which combine food production with other activities and services. These range from greenspaces with food facilities, to fully fledged urban food forests. EFUA also outlined key benefits provided by the various UA Types, with the Picasso Food Forest in Palma, Italy being used to showcase the benefits of the "Community Parks". Simultaneously, a group of researchers led by the University of Freiburg have been investigating potential for combined research agendas on agroforestry and urban forestry. This submission will consider the relationship between the two disciplines and opportunities for further integration in terms of policy and through the delivery of practical initiatives on the ground. Through focusing upon shared benefits and spatial forms, examples of collaborative approaches will be highlighted. The role of mentoring organisations and incentives is considered, particularly with regard to promoting grass roots action, through involving local citizens groups and partnerships.

Urban Forests for All Living Beings

Parallel talks

Instruments and inventories for free protection

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ABSTRACT

Urban forests enhance the ecological balance and aesthetic appeal of cities, and contribute to the overall well-being of urban residents. The preservation of an aging tree population emerges as a fundamental strategy to safeguard the urban forest's vitality and historical significance. Historical tree plantings, such as tree avenues, stand as integral components of a city's tree grid, encapsu-lating the heritage and character of urban landscapes. This presentation explains the intricate network of legal inventories and instruments at different judicial levels, using them to protect (historical) tree plantings. Thus, we aim: (i) to comprehensively explore the legal frameworks, shedding light on federal laws and municipal regulations as important instruments in preserving historical tree plantings; (ii) to provide a nuanced understanding of the diverse instruments (Analysis of protection instruments) used for tree protection, examining how these tools operate within the legal landscape to safeguard urban forests against potential threats; (iii) through con-temporary case studies such as the renewal of a historic promenade or the imminent felling of a historic avenue for the construction of a cycle path, the presentation aims to illustrate the appli-cation of protection instruments. It offers insights into successful strategies for preventing ad-verse interventions in the urban tree substance; (iv) to highlight the argumentative use of eco-system services together with legal instruments by showcasing how these services contribute to the preservation discourse and proposing a holistic approach to protect urban tree populations; and (v) to adopt a holistic strategy in the preservation efforts of (historic) tree plantings. The presentation advocates for an approach that combines legal frameworks, protection instruments, and ecosystem service arguments to ensure the sustained well-being of urban tree populations.

Urban Tree Guard- Safeguarding European urban trees and forests through improved biosecurity

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ABSTRACT

Green infrastructure, including urban forests, has been proposed by the European Commission as a strategy to support climate adaptation capacity and sustainable development in urban areas where over 70% of the EU's population live. Alarmingly, green infrastructure and especially its characteristic elements, trees, are increasingly threatened by alien pests (insects and pathogens) that are introduced primarily through trade and transport. In a new environment, these pests may become invasive, causing devastating environmental and economic losses, and threatening the unique social and cultural values connecting people and nature. Due to the volumes of plant movements, current biosecurity systems often fail to identify and eradicate pest threats in time. New tools and better integration of different knowledge pools are urgently needed to support biosecurity actions in urban settings. We present outcomes from a COST action – Urban Tree Guard (UB3) - which comprises an interdisciplinary network bringing together researchers and innovators to provide solutions for a sustainable tomorrow. The aims of UB3 are to 1) collect, share and harmonize scientific and stakeholder knowledge, 2) accelerate development of innovative technological tools and solutions, 3) inform policy and support implementation of the EU plant health regime while providing science-based recommendations for decision makers, especially at operational levels, and 4) increase European competitiveness in the field of biosecurity to improve the quality of everyday life for urban dwellers, in Europe and beyond. Here, we will present results that highlight the interconnected nature of urban tree health including pathways of entry for alien pests, vulnerable hosts tree species, biosecurity practices of a broad spectrum of managers and decision-makers and potential tools to support safeguarding of urban forests. Teaching tools for education in urban forest health will ensure the long-term impacts of the Action.

Tree species composition in and around cities – a biosecurity perspective

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ABSTRACT

Urban trees are in the first line of attack of invasive tree pests and pathogens because they often arrive with imported goods typically arriving in urban areas and because urban trees are potentially predisposed due to the challenging environment they grow in. For many invasive pests and pathogens, it is not a question of 'if' but of 'when' they will arrive and become established. Therefore, tree species composition and, more specifically, host availability are decisive for the establishment of pests and pathogens. Once established, host availability in areas surrounding urban environments is crucial for further spread to environments beyond cities.

For this study, we analysed 26 urban tree inventories containing about 500,000 individual trees from Swiss municipalities and compared them with the tree species composition in forests within a 10 km radius around these municipalities using national forest inventory data. We then explored and compared host availability for quarantine tree pests and pathogens in municipalities and in surrounding forests. We found that urban tree composition differs substantially from forest tree composition, with 17 times more tree species (>1300) than in forests. Most genera present in forest inventories were also represented in nearby cities. Urban trees provided significantly higher percentages of hosts for invasive tree pests and pathogens than forests. Further, urban trees can also act as host for additional pests and pathogens which would not find suitable hosts in natural forests.

Our results show that the extraordinarily high species richness in urban environments results in a higher host availability for invasive species. This enhances the establishment likelihood of invasive species in urban environments. We discuss the implications of these findings for tree species selection and the opportunities for biosecurity monitoring.

Climate change vulnerability and adaptation in urban forestry: A case study from Mission, British Columbia, Canada

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ABSTRACT

In 2023, the Faculty of Forestry at the University of British Columbia established a Memorandum of Understanding with the Mission Municipal Forest (TFL26), located on the periphery of Mission, British Columbia, Canada. Functioning as a valued recreational space for city residents and holding cultural significance for the Indigenous nations whose territory it spans, the Mission Municipal Forest is recognized as the oldest community forest in Canada. Its overarching objectives include fortifying economic, social, scientific, and environmental values, all while sustaining a diverse array of ecosystem services.

This case study delves into the intricacies of the Climate Change Vulnerability and Adaptation (CCVA) Assessment undertaken by our research group at the University of British Columbia in collaboration with the Mission Municipal Forest team. The pragmatic application of this assessment has successfully bridged the gap between theoretical climate science and on-the-ground forestry practices. Our CCVA assessment has brought to light critical concerns within the Mission Municipal Forest, particularly emphasizing the intricate interplay between forest viability and human livelihoods. These concerns necessitate immediate and robust planning by the Mission Municipal Forest, constituting the focal point of the second phase of our research. Central to this implementation is the development of a comprehensive communication plan, ensuring the inclusive representation of local residents, Indigenous nations, and other stakeholders.

Our research is at the forefront of fostering collaborative and strategic urban forest management, elevating the forest's capacity and resilience in the face of challenges and uncertainties. We aspire to set a precedent for other communities, organizations, or government bodies, encouraging them to prioritize CCVA planning for the sustainable future of urban forests.

WRF-Chem simulations at different scales for urban air quality assessment

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ABSTRACT

The AIRFRESH project aims are to: estimate the air pollution removal capacity by a reforested test area; estimate and quantify the environmental and health benefits provided by urban tree at city-scale; and propose recommendations for reforestation policies for attainment of the air quality standards in both cities. In this framework, we used the WRF-CHEM model to estimate the impacts of urban forests on air quality and meteorology in the city of Florence and Aix-en-Provence. Our modeling set-up makes use of a triply nested domain to downscale the ERA5 forcing data from a coarse domain to a fine scale city domain. For the first step we applied WRF-Chem over a European domain with a horizontal spatial resolution of 15 km, to the urban domains which have 1 km resolution. The model domain has 35 vertical levels and the time period chosen for the simulations is the whole 2019. Here we present results for both municipalities. To analyze the impacts of the urban forests, we elaborated 4 different scenarios modifying the vegetation in a circular area around the municipality of 5 km. The 4 different scenarios are: the current vegetation scenario, the evergreen and deciduous scenarios and the no vegetation scenario realized replacing all the vegetated of the original landcover with the category bare soil or sparsely vegetated. Comparing air quality differences between two cities, demonstrates that the influence of vegetation on air quality varies from one city to another. Unlike its cooling effect on temperature, the impact of vegetation on air quality is more complex. This complexity arises due to a mix of factors including weather conditions and, significantly, the unique combination of human-made emissions in each city. Predicting how vegetation affects air quality in different cities is challenging and requires advanced computer simulations because it cannot be accurately determined without considering these complex variables.

Development of model for optimal tree selection to improve air pollution removal capacity in urban ecosystems -FlorTree

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ABSTRACT

Atmospheric pollution, mainly caused by urbanization, is a threatening problem around the world especially in industrialized countries such as Europe and Asia. Among atmospheric pollutants, tropospheric ozone (O3), nitrogen dioxide (NO2) and particulate matter (PM2.5 and PM10), are the most dangerous affecting citizens' health. Urban trees can reduce the air concentrations of these pollutants thanks to stomatal uptaking and allowing dry deposition on their canopies. On the other hand, some species emit hydrocarbons (VOCs) such as isoprene and monoterpene that are O3-precursors leading to air quality deterioration. For this reason, within AIRFRESH project (LIFE19 ENV/FR/000086), we developed FlorTree an innovative single-tree model to estimate the flux of air pollutants and select the best species for urban greening. FlorTree considers species-specific parameters such as tree morphology (height and crown leaf area), leaf/shoot structure, leaf habit (deciduous or evergreen) and physiological responses (stomatal conductance and VOCs emissions) to environmental factors. Hourly concentration data for air pollutants (O3, NO2, and PM10) and meteorological parameters (temperature, solar radiation, relative humidity and wind speed) were recorded during one-year of observations and used as model input. In this study we compared the urban trees' removal capability in cities characterized by different pollution situations: two European (Florence, Italy and Bucharest, Romania) and an Asian one (Tokyo, Japan).

Influence of increased soil moisture on tree stability in Zagreb urban forests

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ABSTRACT

Severe weather events that are accompanied by a large amount of rainfall are the major cause of tree failures in the urban environment. As there is growing number of such events, the time span between those is reduced, thus increasing the risk of property damage and personal injuries due to tree failures.

Urban forests in City of Zagreb are integrated into urban surroundings but they face the challenge that comes with unfavorable living conditions. Because of their proximity from residential areas they are often visited, and as an essential element of the city's urban green infrastructure, they provide numerous benefits to the urban dwellers.

To determine the tilting and anchorage of urban sessile oak trees under increased soil moisture conditions tree stability assessment based on the static pulling test of urban trees was conducted prior and immediately after high rainfall events. Soil volumetric water content was measured in both cases in order to determine the role of increased soil moisture on tree stability.

The results revealed that the increased soil moisture after severe rainfall events reduced root mechanical reinforcement to the soil which lead to reduced safety factor in tree stability assessment. However, even with this reduction in root stability, majority of trees had a safety buffer that enabled them not to be in a risk of tree failure due to temporary reduced tree stability.

Urban Forestry Advances – Concepts and Initiatives

Parallel talks

Importance of forests and green spaces in urban and peri-urban areas – nexus between human well-being and city branding

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ABSTRACT

In recent years, especially with the increasing effect of urbanization, economic and environmental factors for sustainable urban areas have arisen. Cities are regarded as a link between people and nature that are in high demand of ecosystem services but also generate high environmental impacts. The increasing effect of urbanization raises the question of poor health related to modern lifestyles. Additionally, people with disabilities and chronic illnesses demand alternative care. Therefore, to enhance the quality of life alternative ways to prevent diseases, lack of physical activity and stress have occurred. Moreover, efforts to promote universal health and well-being in urban areas have become increasingly complex. Green spaces in urban and peri-urban areas can be seen as an element that provides needed environmental, esthetical, recreational and economic services.

The increase in urbanization did not passe Zagreb, the capital of Croatia. Since the beginning of the 20th century, the city's population increased twelve times. Furthermore, besides the residents, the number of tourists is increasing every year. With the increasing number of residents and non-residents, the issues that concern urban forests and green spaces are more obvious than ever. Today, their role in improving cities' climate, people's well-being and general quality of life is a fundamental challenge and an opportunity in the decision-making process for a livable, healthy and resilient city.

This paper aims to, theoretically, present the role of forests and green spaces in urban and peri-urban areas and their importance in maintaining the balance between human well-being and city development.

The Expanding Northern Forest - delivering transformational change in the North of England

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ABSTRACT

The Northern Powerhouse was a concept launched by the UK Government in 2014 to help boost the economic growth of the north of England. The proposal aimed to reposition the UK economy away from London and the South-East and although it had some success, it was deemed by the London School of Economics to be a "vague and problematic concept". This stimulated the launch of a Revised Northern Powerhouse Strategy in 2016 which included the launching of the Northern Forest, a 25-year tree establishing programme that would focus upon greatly enhancing the economic viability of the northern towns and cities by improving the health and well-being of their communities and the biodiversity of the regions.

The Northern Forest stated that "Our area is changing - we need to respond" and so the key aims of the programme were to improve the environment of the northern poly-centric regions by establishing trees as a means of increasing their capacity to attract and retain investment, to create greenspace and habitats and to ensure the appropriate retention and management of existing woodlands and other environmental assets.

An independent Five-Year Impact Report on the first five years of the Northern Forest was commissioned and published in 2023, which proved to be very complimentary on the success and achievements of the project. As a result, the UK Government set up four more community forests in the UK, three of which are in the north of England, and so the Northern Forest has expanded.

This presentation will consider the results of the Impact Report, including the many benefits that urban communities have received from the establishment of over 6 million trees, will present a number of examples from some of the key northern cities and will report on the current development of the Northern Forest Spatial Masterplan that will detail the next phase of the Northern Forest's journey.

From forest to urban trees: Shall we gather all tree specialists to improve planning and maintenance of treescapes?

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ABSTRACT

Increasing the number of trees outside forests represents one of the most promising nature-based solutions to climate change impacts in Switzerland. Their effects on limiting heat islands in cities and water evaporation in agricultural fields interest the majority of people. Urban forestry was only recently integrated into our forest policy, having previously been approached through "partnership goals". A new national focus on all trees outside forests was made possible by the action plan of the 2030 strategy for sustainable development. Ratified by our highest political authority, this instrument has allowed us to gather and consult key stakeholders.

Trees outside forests are dispersed across the whole gradient from forests to city centers in Switzerland, with noticeable discrepancies according to regions. Coordination at national level between numerous stakeholders, starting by the administrative structures interested in trees, represents a major challenge. Our presentation will provide a snapshot of an administrative attempt to build a multistakeholder-platform dedicated to all trees outside forests. We first describe crucial steps of urban and agroforestry policy integration. We then discuss some pros and cons of building coordination structures to move beyond sectors, at a treescape-level. We conclude that there are thresholds between the intensity put into coordination mechanisms and the expected outcomes, but that the gathering of people provides better effects than any attempt to follow formal, impersonal, consultation processes. To launch transformative processes, we argue that focus has to be put on the added value of collaboration rather than on the initial form of a cooperation mechanism.

In our on-going Swiss process, while gathering interested people allows us to look for improved tree management pathways and creates collective intelligence, knowledge management for all represents the next key challenge.

Insights and frontiers for research in urban forest labs: results from the TU Delft climate arboreta project

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ABSTRACT

Between 2020 and 2023 the TU Delft's urban forestry group carried out a hybrid research project centered on a number of so-called climate arboreta. Each climate arboretum was an collection of 75 different tree species commonly growing in CfB climate zone cities. In one arboretum, the trees were in above-ground containers on the forecourt of the Faculty of Architecture; in another, the trees were planted in a neighborhood park in Almere-Buiten. In a third arboretum, the trees stood in an open field among tiny houses in an outlying area of Dordrecht, an installation that later moved to the Floriade expo site in Almere. The research has developed new insights into the relationship between tree architecture and urban microclimate, measurement protocols for sensing atmospheric data on trees, data on cooling performances of different species, technical innovations for experimental 'mobile urban forests', and insights into resident and visitor interactions with living forest labs, which may impact health, well-being, social cohesion and engagement with nature.

Branching Out: Mapping value in urban treescapes

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ABSTRACT

It is understood that social and cultural values held for urban treescapes are created through the relationships people develop with them over time. These values are wide-ranging and there is no agreed definition for them. In order to design and manage urban forests that deliver benefits for all we should develop our understanding of the relationships between people and urban trees and the multiple ways these may be expressed. These values are rarely included in decision-making because the ways that they are expressed do not align with current decision-making processes.

Branching Out is a collaborative, interdisciplinary research project which aims to discover social and cultural values of urban treescapes through storytelling, discussion, remote-sensing, and design. The project focuses on three UK cities (York, Cardiff, and Milton Keynes), representing a range of urban types from medieval market town to modern garden city.

Historical and new stories about trees have been collected as written and oral folk tales and through storytelling workshops, and have been analysed in terms of social and cultural values and tree characteristics. Citizen panels were held in the three focal cities, in which participants discussed their thoughts about trees and located trees of particular value or meaning on a map of the city.

Hyperspectral and broadband imagery was collected during flights over the focal cities, and a novel Deep Learning method was developed to process the data into individual tree datasets.

The main challenge in this project is integrating the social and cultural values qualitative data with the quantitative data in the machine-learned tree map. We have related social and cultural values collected in the project to tree characteristics and locations, to build a map of social and cultural values across a city. Such a map has the potential to lead to better management and expansion of urban forests that deliver these social and cultural values.

Developing a concept to assess ecosystem service through citizen science

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ABSTRACT

The importance of urban forests for the provision of ecosystem services is uncontested. Monitoring these ecosystems' availability is a key process to discuss planning and management measures and provide information for policy makers. Particularly urban forests i.e., close to or in urban areas, are used by various stakeholder groups, who benefit of the services provided by a forest. The development of a monitoring tool to track the ecosystems' key variables would secure the provision of most ecosystem services, improve the data basis for decision making processes and allow comparisons between different forests. Also, recreational forest visitors, as they regularly use the provided services, could support the data collection process through e.g., citizen science approaches. Thus, this study aims to (i) identify and analyse current monitoring tools that assess ecosystem services, (ii) identify how the method citizen science is applied in these studies and based on this information (iii) develop and propose a holistic and agile concept for evaluating and monitoring all ecosystem services through the involvement of society e.g., citizen science. Therefore, we conducted a literature review, eighteen semi-structured interviews with practitioners from different fields (e.g., nature conservation and education) and three co-creation workshops at different policy levels to expand and validate the proposed concept. Our research shows that such a toolbox is desirable and needed. It would foster the transition to more sustainable and healthy ecosystem services and raise society's awareness for the importance and maintenance of urban forests through the active participation in data collection. Additionally, this study shows that depending on the ecosystem services assessed and monitored, citizens can support the monitoring process e.g., recreational services, while for others e.g., oxygen production, expert knowledge is demanded, as the assessment and monitoring is too complex.

Tree canopy change in tear-down redevelopment: the challenges of housing densification

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ABSTRACT

The purpose of this presentation is to describe and assess canopy loss as a result of single lot redevelopment teardown in Montgomery County, Maryland. The processes and outcomes of other activities, both regulatory and non-regulatory tree planting programs that are intended to maintain or increase canopy cover, are explored. The presentation documents, using case studies, the teardown process, development process, and post occupancy landscape conditions. It further explores conflicts between water-centric regulations and tree-centric regulations.

The loss of tree canopy is on ongoing concern in urbanizing landscapes. Canopy losses are the result of a number of activities, including individual tree mortality, property owner removal, development(greenfield development), and redevelopment (greyfield development). The State of Maryland has been a leader in a number of green infrastructure and forest conservation efforts in the United States. The Forest Conservation Act (FCA), developed in 1991, was the first statewide forest regulation to mitigate forest loss during the development process.

The FCA, while assisting in both protection and afforestation of forests in the development process, does not typically address tree loss through single lot redevelopment. More recent jurisdictional initiatives, including a new tree canopy cover law, have provided more fine-scaled approaches to maintaining urban forest and forest canopy, in particular on redevelopment properties. The purpose of this presentation is to describe and assess canopy loss as a result of tear down in Montgomery County, Maryland. Further, processes and outcomes of other activities, both regulatory (e.g., Environmental Site Design - ESD, etc.,) and non-regulatory (tree planting programs, etc.,) that are intended to maintain or increase canopy cover, are explored. Conflicts between water-centric ESD regulations and tree laws are explored.

Posters

Comparing different management options of urban forests in terms of emissions and removal capacity of CO2 and PM2.5 in a Mediterranean context

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ABSTRACT

Tree planting has been globally proposed as the most effective solution to address multiple environmental and social challenges. Large-scale tree planting campaigns have been launched worldwide, financed by governments and businesses, especially to improve the quality of life in urban areas. However, this planting momentum has revealed that trees require extensive planning and an ongoing commitment to achieve the intended targets and ensure tree viability. Notably, there is a lack of studies regarding the environmental impacts related to different planting and management approaches, particularly on air quality and climate regulation. This study aims to analyze the balance between emissions and removal capacity of a new urban forest under different plantation and management options (i.e., planting layout, tree density, and intensity of forestry practices). A simulation of an Italian urban forest planting and growth was conducted, employing data from three oak species (Quercus ilex, Q. petrea, and Q. robur) over a 50-year period. The i-Tree Canopy tool was used to estimate the annual capacity of the forest to remove PM2.5 and sequester carbon, based on specific diametric increments of the tree canopy each year. The Life Cycle Assessment was employed to estimate the emissions at every life cycle stage and for different management options. As expected, the results suggest that the lower the management intensity, the lower the emissions, and the greater the number of trees, the greater the removal capacity. However, the net balance between emissions and removals suggests that the urban forest's option with double the planting density and equal management intensity allows for sequestering just +13.5% and +7.9% (CO2 and PM2.5, respectively). The proposed combined approach seems promising for identifying a win-win solution between management and net removal capacity, allowing for cost savings, reduced seedlings, and better targeting efforts within the forestry industry.

The European urban tree inventory – an update

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ABSTRACT

Many European cities are establishing and maintaining urban tree inventories to aid management of urban trees. These inventories give an insight in the species compositions of urban trees and are of high interest to practitioners and researchers alike. In Europe, there are many more tree species in urban environments than in the surrounding forests. This species richness is at risk in general due to the harsh conditions for trees in urban environments, and in particular due to ongoing climate change. Furthermore, most invasive forest pests are first introduced in urban or peri-urban environments before they spread further, making urban trees potential steppingstones for pests of trees in other cities or surrounding forests. Therefore, knowledge on urban tree species composition can be used to inform monitoring efforts for invasive forest pests, to the benefit of urban and surrounding forest trees.

We set out to make a comprehensive collection of European urban tree inventories as part of the COST-action UB3Guard. We received 178 inventories from 27 countries, containing around 9.6 million individual trees belonging to >2700 species. We present preliminary findings on how climate and culture explain urban tree composition in Europe. We furthermore show implications for urban and forest tree biosecurity in Europe, with a focus on potentially invasive forest pests.

Hall-like urban forests: sustainable concept for temporal brownfield transformations

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ABSTRACT

This study introduces a innovative approach for revitalizing temporary brownfield sites in cities through hall-like urban forests. Focused on a construction site near Zurich, the concept addresses challenges posed by construction debris and contaminated filling materials that create conditions favoring the proliferation of unwanted neophytes.

In collaboration with Zurich University of Applied Sciences, a comprehensive framework envisions aesthetically pleasing and functionally effective green volumes. Leveraging the parcel's substantial size, it can be strategically divided into zones, each adhering to distinct urban forest concepts.

Resilient riparian and shoreline trees are incorporated into the design to enclose the open space and provide shading for the street. This integration enhances biodiversity and establishes a hall-like urban forest characterized by an extensive, minimally tiered tree canopy and layer of woody vegetation. This urban forest offers multifunctional applications and connections to various urban demands. The dense tree canopy achieves the desired shading effect and facilitates fresh air permeability, contributing to a cooling effect.

Tree bands serve as a natural barrier, capturing and evaporating runoff water. Alternating between tall trees and hedge structures, these bands mimic typical agricultural elements and expedite ecosystem services. Rapid tree growth accelerates the provision of ecosystem services and aids in extracting potential pollutants from the soil, fostering soil quality improvement.

This innovative concept of hall-like urban forests provides a transformative solution for regenerating temporary brownfield, often persisting as underutilized spaces in urban landscapes, evolving into undesirable problem sites. Implementation of this urban forest concept not only enhances overall quality of life for urban inhabitants but also significantly contributes to improving various environmental factors within the city.

Mapping pollen allergenicity from urban trees: a tool for green infrastructure planning

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ABSTRACT

Urban vegetation provides many benefits to citizens but also has associated disservices such as pollen allergenicity. Pollen allergies affect 40% of the European population, a problem that will be exacerbated with climate change. We study the allergenic characteristics of the urban trees and urban parks of the city of Valencia. The Value of Potential Allergenicity (VPA) has been calculated for all species. The most abundant allergenic trees with a very high VPA were the cypresses, while Platanus x hispanica and species of genera Morus, Acer and Fraxinus showed a high VPA. On the contrary, Citrus x aurantium, Melia azedarach, Washingtonia spp., Brachychiton spp. and Jacaranda mimosifolia were among the most abundant low allergenic trees. VPA was mapped for the city and a hotspot analysis was applied to identify areas of clustering of high and low VPA values. This geostatistical analysis provides a comprehensive representation of the VPA patterns which is very useful for urban green infrastructure planning. The Index of Urban Green Zone Allergenicity (IUGZA) was also calculated for the main parks of the city. The subtropical and tropical flora component included many entomophilous species and the lowest share of high and very high allergenic trees in comparison with the Mediterranean and Temperate components. Some of these species, which are common in the city, may also be very appropriate for the future climate, given their tolerance to drought and high temperatures. Overall, a diversification of tree species avoiding clusters of high VPA trees, and the prioritization of plants with low VPA are good strategies to minimize impacts of urban trees on human health.

Accessible urban forestry education: Launching the FAO eLearning course 'Introduction to urban and peri-urban forestry'

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ABSTRACT

Urban forestry is becoming increasingly important as cities around the world work towards greener, more sustainable and resilient models of urban development. As defined by the United Nations' Food and Agriculture Organisation, forests and trees in urban and peri-urban environments, if properly managed, can make important contributions to the planning, design and management of sustainable, resilient landscapes. But what is so-called proper urban forest planning, design and management? How can we ensure a shared understanding of urban forestry among partners and stakeholders?

Together with the UN FAO e-Learning Academy, the authors developed this peer-reviewed e-learning module, 'Introduction to Urban and Peri-Urban Forestry'. The course is open and accessible to all, self-paced, accounts for different learning styles, emphasises both knowledge and skill and is also available offline. The FAO Guidelines on urban and peri-urban forestry (2016) serve as a starting point for four lessons with rich audio-visual material and practical examples from all global regions: (1) introduction and basic concepts, (2) why urban forests are important, (3) who is involved in the planning, design and management of the urban forest, and (4) urban forestry challenges in a changing world. After completion of the accredited assessment test, learners receive a digital certificate from the FAO e-Learning Academy.

The primary target audience for this course is staff responsible for creating or managing urban forests, including those working in public or private organisations and the voluntary sector. Other interested parties, like local communities, would also benefit from the lessons. As urban forestry is rich and multi-fold, with different meanings for everyone in the world, this online course seeks to communicate and educate on and about the urban forest in a way that is available and accessible to all.

Urban forestscapes. The city of Delft as a woodland complex

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ABSTRACT

Because the expansion of the urban forest will take place in and around existing cities, knowledge of the 'language' of the existing urban forest is indispensable. Tree language refers to the spatial relationship between tree species, planting configurations and plantations and their unique location. To understand the role of the urban forest for people and society a focus on the spatial-experiential aspect (in relation to the human body and human perception) is relevant: trees frame the space in which people move, act, experience and appreciate. Using the city of Delft as a case study, this presentation explores the notion of 'plantation' as one of the defining aspects of such a language, the others being 'species' and 'configuration'. 'Plantation' is proposed as a term to describe the wooded characteristics of areas in the urban realm, defined by a combination of characteristics of species, tree configurations and the density and morphology of the plantation. (This mosaic of plantations can be compared to a natural forest mosaic which is also determined by commonalities in species and vegetation community structure, as well as having alternations of densely wooded and less wooded areas). The research was carried out combining the databases of the municipality of Delft and TU Delft , supplemented by historical documentation and cartographic research, and validated by field work: observation at eye level, a multisensory, active interaction with the urban landscape. The research reveals an urban landscape composed of a variegated wooded mosaic of plantations, which invariably transcend neighbourhood boundaries as well as common understandings of the boundary between city and countryside. In successive density and arrangement, in Delft seven types of plantations can be distinguished, connected and separated by the long lines, the avenues that traditionally formed the connections between Delft and the countryside like spokes in a wheel.

Gardens vs street trees in Lisbon: contribution for the regulating ecosystem services and diversity

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ABSTRACT

Lisbon area have 34% green spaces, of which, 14% are gardens and parks and 18% are street corridors, where trees play pivotal but different roles for ecological sustainability and aesthetic enhancement. Managing tree community in gardens is quite different than doing it in public streets, with implications in the potential benefits of these green structures.We compare composition, structure and regulating ecosystem services (using iTree) of representative old gardens, with the street trees of the respective parishes: Estrela garden (EG with 4.5ha) from Estrela parish, Principe Real garden (PRG with1.2ha) from Misericórdia and Parada garden (PG with 0.4ha) from Campo de Ourique. This last one was used to develop 4 30years-scenarios of potential urban forest dynamics: a) BAU; b) replacement of 8 adults Celtis australis by 4 young, due to expansion of Metro network; c) loss of 23 random C. australis due to fungal infection (Inonotus rickii); d) removal of the 2 monumental specimens of Metrosideros excelsa.Our results show that streets have higher tree richness and diversity when compared with PRG and PG. In EG tree diversity is 35% higher than in streets. Age structure is more diverse in the streets, comprising a larger fraction of young specimens. Average values of avoided run-of and pollutant removal are higher in the gardens. There, the installation in bare soil with incipient pruning, allows adult trees to have their organic shape resulting in productive canopies and, in general, high rate of carbon sequestration and storage.Despite lower diversity, the PG boasts a notable density of 314 trees/ha. The forecast analysis anticipates for scenario c) an initial reduction in replacement value (-27%) and avoided runoff (-67%) in 30-years. These projections stress the need for a methodical tree renewal initiative.The results aid in the identification of a city-wide strengths and weaknesses, enabling judicious, localized interventions for effective urban forest management.

Urban forests as a site for Naturavita project's educational activities – raising awareness about the importance of integrating natural environment in inclusive education

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ABSTRACT

Forests in the face of current climate challenges are undergoing significant changes, and the formation and implementation of green-blue infrastructure are no longer solely focused on improving air quality and the environment in general. Instead, an emphasis is put on the importance of integrating the natural environment into education at all levels including also inclusive education, all this being aimed at enhancing overall quality of life. In this work, we particularly highlight urban forests as sites for inclusive education and the promotion of involving socially sensitive groups, justice and community interaction. As part of the activities of the Naturavita project "Establishing educational infrastructure, implementation of education and awareness raising", a total of 115 workshops were carried out with more than 5000 school students, as well as university students. The workshops were interactive and interpretative in nature, with the goal of developing a positive attitude towards nature conservation and a responsible approach to the environment. Each workshop concluded with the planting of oak saplings in the "Friendship Alley." The students of Educational Rehabilitation, who attend the course Sustainable Development and Inclusion and professors from the Faculty of Education in Osijek, as well as participants (students with difficulties), teaching assistants for children with difficulties and educational rehabilitators from the Centre for Education and Training "Ivan Štark" in Osijek, took part in a workshop at the educational-visitor centre "Podravlje". World Forest Day and World Down Syndrome Day were celebrated at the special class of the "Dr. Franjo Tuđman" Primary School in Beli Manastir including Down syndrome students too. Nature conservation, especially forests, and a space adapted to the learning and needs of all target groups, are significant and sustainable values of the renewed forest house "Podravlje" within the Naturavita project.

Perceptions of tree risks and benefits in a historically African-American neighborhood

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ABSTRACT

An expansive body of research demonstrates the social and ecological benefits of urban forests, although urban tree canopy density tends to be lower than average in areas occupied by marginalized populations. Non-profit organizations and local governments have initiated tree-planting programs; however, some of these programs have encountered local resistance. This study took place in a historically African American neighborhood in the Southern USA with a low tree canopy where residents expressed disinterest in replanting trees following a tree hazard removal campaign led by a local non-profit organization. Employing focus groups and interviews, we explored residents' environmental attitudes and risk perceptions by asking about risks and benefits of neighborhood trees and barriers to enjoyment of them. Materials and emotional bonds residents have with the neighborhood informed their preferences about trees and green space. Trees were often vied as hazards and financial risks, although they were an integral part of residents' identities for themselves and their community. Findings suggest that neglecting to look at diverse perceptions will challenge a city's ability to communicate about the urban forest and, therefore, sustainably address disparities in tree benefits and problems.

Sustainable roadside greenery: long-term success of climate-resilient avenue concepts

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ABSTRACT

In 2014 the Zurich University of Applied Sciences undertook a unidirectional replanting initiative for the roadside greenery as an integral component of an all-encompassing road renovation project. This bustling traffic axis frequented by heavy vehicular traffic and trams, witnessed the implementation of a strategically planned greening strategy. The structurally robust substrate, characterized by its granite emphasis and proven efficacy in inner-city settings, was meticulously employed. This novel planting initiative culminated in the completion of an avenue, further enriched by the addition of 19 Platanus x hispanica specimens. The primary emphasis was on underplanting the plane trees, designed to be low-maintenance and serve as mechanical protection for the trees.

A decade later, an success evaluation was conducted to assess the long-term development of the avenue. The outcomes of this evaluation played a pivotal role in refining a avenue concept, with a view to utilizing the newly established shrub-oriented underplanting for climate-resilient tree planting.

A comprehensive analysis encompassing 47 plant species was conducted. Beyond the inclusion of Mahonia 'Apollo,' additional drought-tolerant and heat-resistant small shrubs successfully thrived. Certain perennials showcased salt tolerance. Soil samples extracted also revealed the optimal development of the Basel tree substrate over the course of a decade. The incorporation of nutrient inputs and humus formation proved instrumental in ensuring that the trees received sufficient water and nutrients, even during extended periods of drought and heat without regular maintenance.

The trial has demonstrated that the roadside greenery, fortified by woody underplanting and the resilient tree substrate, can endure future climate changes without necessitating maintenance. The outcome is a sustainable avenue concept characterized by minimal green space management.

It's not easy being cool: assessing urban greenspace as a heat adaptation strategy based on residents' perceptions

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ABSTRACT

As a consequence of climate change, heatwaves are becoming more frequent and severe, severely affecting human well-being. Greenspace can alleviate this through its cooling effect on the urban microclimate. However, relatively little is known about the relation between different types of neighbourhood greenspace and residents' experience of heatwaves, which makes it hard to assess its effectiveness in mitigating heat stress. We investigate this through a survey among residents of The Netherlands (n=2677). We ask about two aspects: general thermal comfort during heatwaves, and the possibilities of finding sufficiently cool places in their neighbourhood during heatwaves. We associate responses with green space around their addresses, objectively measured through fine-scale spatial data. We assess 3 metrics based on the '3-30-300 rule', which states there should be at least 3 well-established trees visible from each house, there should be a minimum of 30% canopy cover in each neighbourhood, and each house should be at most 300 meters from public greenspace. We use ordinal regression to analyze responses. To accurately assess the effect of greenspace, we correct for age, gender, income, self-reported health, urban density, and the regional climate. The greenspace measures are iteratively added to the model. For residents' ability to find adequately cool places in public space, all 3 have significant relations in the expected direction, with the '3 rule' and the '30 rule' having the strongest effects. In our model, the effects of these greenspace measures are greater than those of sociodemographic respondent features, the regional climate, and urban density. For general thermal comfort, green space effects are weaker, although still significant, except for the '300 rule'. Robustness/multicollinearity tests validate our findings. Our results highlight the importance of different types of greenspace to help neighbourhoods adapt to the increasing frequency of heatwaves.

Establishment of woody vegetation on urban schoolgrounds

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ABSTRACT

This PhD project stems from the fact that vegetation and natural areas integrated at multiple scales are essential for ensuring a healthy development for children. In urban areas, where natural green areas often are lacking, school grounds play an important role for children in providing opportunities for contact with nature. In addition to these direct benefits to humans, vegetation in school grounds often contribute to sustainability in a larger perspective, for example as part of green infrastructure.

Despite this, vegetation is often lacking or overseen in the development of school environments. In addition to the challenges facing urban vegetation in general, school grounds often pose additional challenges. This is mainly due to the increased level of wear and tear caused by active use of the vegetation and higher levels of soil compaction, types of disturbance which is enhanced in school grounds of limited size. Methods for vegetation establishment that are successful while simultaneously allowing use of the vegetation are important to avoid excluding children from large parts of their school grounds during longer periods. There is a lack of studies focusing on establishment of woody vegetation on school grounds, although there is a high need for it.

Therefore, this project has an interdisciplinary mixed methods approach in order to gain understanding for vegetation establishment on school grounds from various perspectives. The project includes literature research, controlled greenhouse experiment, interview study as well as in situ experiments on school grounds. At the end of the project guidelines for woody vegetation establishment on school grounds will be generated and shared with professionals in the field.

This PhD project is planned for defence in the Spring of 2025 and is thus in its final year. For the EFUF2024 conference I will present the results and insights from this project thus far.

Mapping the perceived health benefits of urban green and blue spaces: A PPGIS study in Vienna, Austria

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ABSTRACT

Green and blue spaces play a crucial role in supporting human health and well-being through various pathways. They offer opportunities for active recreation and play, contribute to building restorative capacities, foster social and community wellbeing, and mitigate negative health effects of urban areas. While convincing evidence base exists linking exposure to green and blue spaces with diverse health outcomes, our understanding of the characteristics of green and blue spaces that support multiple health benefits remains limited.

This study provides a spatial analytical perspective on the co-location of diverse perceived health benefits of green and blue spaces. Utilizing data collected with Public Participatory GIS (PPGIS), a digital participatory mapping method, we investigated the actualized visitation of urban green and blue spaces among adult residents of Vienna, Austria, and the perceived health benefits associated with these visits. The participants of an online survey (n 1723) located more than 6000 frequently used sites for green and blue space visitation on a base map. Of these sites, 52% were identified as places for active recreation and 51% as places for social activities. Additionally, 37% of sites were marked to promote stress reduction and 52% relaxation. Heat mitigation was associated with 24% of the marked sites. The study proceeded to examine associations between the perceived health benefits and characteristics of the visited green and blue spaces. Getis-Ord Gi* hot spot analyses were used to study the spatial distribution of the perceived health benefits in the study area and identify locally important green and blue spaces providing a variety of health benefits. Overall, the study provides insights on the environmental correlates of health-supportive green and blue spaces and an analytical framework for identifying such areas in local planning and spatial decision-making.

The study is funded by the Austrian Science Fund (FWF-P-35066-G).

Challenges - before, during and after construction of Forest Trail Bliznec

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ABSTRACT

Public Institution Nature Park Medvednica (Public Institution) made nature accessible to all in 2002 with the creation of the Forest Trail Bliznec, Croatia's pioneering educational trail tailored for both visually and physically impaired individuals. Realization of this trail was great accomplishment because of many challenges along the way. The first challenge in tackling physical-architectonic barriers was finding the right location where such trail could be constructed since the relief of the Nature Park Medvednica (Park) is very slant, characterized by steep ridges. A list of needed conditions was defined in cooperation with Croatian Union of Associations of Persons with Disabilities. The value of the trail was recognized by the whole Croatian public, and in 2002, Public Institution received an award from Ministry of Environment Protection, Physical Planning and Construction for achievement in the area of environment protection while in 2021, for the first time Croatia was included in the "Handbook of good practice examples on accessible tourism in rural and natural areas" of the World Tourism Organization because of the trail. Over the years, various activities have been organized along the trail to bring all visitors closer to the natural values of the Park near the capital city of Zagreb. In 22 years, Forest Trail Bliznec faced natural hazards, vandalism and decline. Now it is closed for public use due to bad condition and the future of the Forest Trail Bliznec is uncertain. The goal of the Public Institution is to completely reconstruct trail, but there are still many challenges that we have to face. With this paper, we want to explain the mechanisms of legalization of the public infrastructure located in the Park with the aim of restoration for the public benefit, for all stakeholders and visitors with special consideration for those with disabilities.

Towards better comparison methods to enhance the provision of urban ecosystem services

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ABSTRACT

In this research, we systematically assess alternative methodologies for comparing the provision of ecosystem services within urban areas, emphasizing the consequential impact of the chosen comparison method on the capacity to evaluate outcomes for enhancing management strategies in urban green spaces. This evaluation extends to considerations of mitigating environmental inequality and ensuring optimal levels of human well-being. Employing a quantitative approach, we utilized ten spatial indicators to appraise the provision of urban ecosystem services in Barcelona, Spain, and Santiago, Chile. Two distinct comparison methods were employed in both cities to scrutinize variations in provision scores. The analysis was conducted through the utilization of the Ecosystem Management Decision Support (EMDS) system, a spatially enabled decision support framework designed for environmental management applications. The results illustrate alterations in the values associated with the provisioning of ecosystem services contingent upon the applied methodological approach. When examining data separately for each city, diverse provision values were observed across city districts, spanning from very low to very high values. Conversely, when consolidating data from both cities for joint analysis, provision scores exhibited a decrease in Santiago, accompanied by an increase in Barcelona. This discrepancy underscores the relative and nuanced nature of provision, impeding a precise definition for appropriate planning. Our findings underscore the critical significance of the chosen comparison approach in the analysis of urban ecosystem services and advocate for further investigation into comparison methods.

Carbon stocks in forest floor and soil in sessile oak (Quercus petraea Matt./Liebl.) stands in the Maksimir Park-Forest

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ABSTRACT

The role of forests in the carbon cycle is widely researchd and to a great deal, known. Forests absorb carbon dioxide from the atmopshere and store it in different repositories, called carbon pools, which include trees (both living and dead), root systems, undergrowth, the forest floor and soils.More than half of the total carbon in forest ecosystems is stored in the soil. In general, according to the European Environment Agency (2019), about 75 billion tons of organic carbon (OC) are stored in the soils of the European Union countries.

On July 14, 2021, the European Commission accepted a series of legislative proposals which wants to achieve climate neutrality in the European Union by 2050, which includes intermediate goal of reducing net greenhouse gas emissions by 55% by 2030. To reach this goal it is crucial to manage carbon sinks more efficiently. Unused soils (or lands) in urban areas can store equal amounts of OC like those from rural areas. At the same time, several factors indicate how carbon storage in urban areas can potentially increase so Brown et al., (2012) state that intensive management of urban soil can lead to larger carbon stocks than in similar rural areas. Therefore, carbon storage in urban areas is an important function that needs to be managed (Soil Resource Efficiency in Urbanized Areas, 2016). Urban forests and their carbon storage possibilities have not been investigated in detail so far.

The results of the research paper proposed for this Forum provide a preliminary insight into the state of urban forests and oak forests in the context of OC stocks in the forest floor and soil, and as such can be used for comparison in future research that is necessary to effectively and permanently manage terrestrial ecosystems at the national level, which supprots the cause of achieving climate neutrality.

Safeguarding childhood explorations: a comprehensive inventory and analysis of woody plants in Ljubljana's kindergarten playgrounds"

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ABSTRACT

The greenery in kindergarten playgrounds, which is often taken for granted, serves as a dynamic backdrop to a child's early and everyday experiences with nature. Understanding the species composition, the condition of trees and the diversity of woody plants is essential as these aspects play a crucial role in the overall well-being of kindergarten children.

This study focuses on an inventory of woody plants in 26 public kindergartens in Ljubljana, Slovenia. We have listed individual plants and groups of woody plants, trees, shrubs, hedges and climbers (N= 1312). The study not only catalogues the different species present and details such as location, species, health status, size and photo documentation, but also investigates the potential presence of poisonous plants, allergenic species and injurious trees with the aim of creating playgrounds that are not only educational but also safe to explore.

We have highlighted species that have toxic parts and are potentially harmful to children if ingested or handled. The hazard analysis investigate structural aspects and identifies any risks associated with the physical attributes of these trees. Finally, our study delve into the allergenicity of the woody plants, taking into account the impact on the health and well-being of children and the surrounding communities.

By analysing woody plants in kindergarten playgrounds, we aim to provide green space designers and managers with insights that can help them make decisions about species selection and management. By prioritising the health, diversity and safety of woody plants in these outdoor learning spaces, we contribute to create safe, healthy and resilient environments that prioritise children's wellbeing.

Citizens' perception of the presence of coypu (Myocastor coypus) in urban environments: the case study of the Urban Park of Serravalle in Central Italy

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ABSTRACT

The coypu (Myocastor coypus) is a rodent native to South America which has been introduced in many countries being a valued furbearer and subsequently has become invasive. The coypu is an opportunistic herbivore, preferably living slow-flowing or standing water bodies with abundant hydrophytes and riparian vegetation. For this reason, the coypu population is rapidly growing in both rural and urban areas with deep impacts on new colonized environments. Monitoring and management of coypu is a key issue in Europe since this species has been included in the EU Invasive Alien Species Regulation 1143/2014. The management of this alien species in urban parks, gardens and riverside is a key point for urban planners and managers, considering the potential conflictual relationships between coypu behaviour and human activities. The aim of this study is to investigate citizens' knowledge, perceptions and opinions towards the presence and management of coypu in a case study in Italy (Urban Park of Serravalle, in Empoli municipality, Tuscany region). To this end, an online questionnaire survey was conducted with a sample of citizens of the municipality. The questionnaire has been completed by 280 visitors of the Park. The results showed a high level of knowledge of respondents towards this alien species: 99.3% of total respondents had heard of coypu before this survey, while 93.9% were able to distinguish the coypu from the beaver (Castor fiber). The results highlighted that the majority of respondents are happy to meet this species in the Urban Park of Serravalle or they are indifferent to its presence (38.7% and 34.1% respectively). Most of respondents were against the removal of coypu from the study area (44.6%), while those who were in favour of this form of population control are 28.9%. Results of this study could support managers in improving the effectiveness of management actions through an information program involving people living close to the Park.

Phytoremediation as urban forestry strategy. The case study of the Metropolitan Area of Milan

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ABSTRACT

In the context of increasing urban development, soil health conservation is a crucial commitment to ensure the ecological sustainability of cities. As agriculture and industry, human activities contribute significantly to soil degradation and contamination, constituting risk for the ecosystem and human health. Designing new effective and natural remediation strategies defines a new alternative path to the traditional expensive and environmentally impactful reclamation techniques, which treat contaminated soil as a particular waste to dispose of.

Phytoremediation is an emerging remediation technique that uses plants to extract, stabilize or degrade soil pollutants with less environmental and economic impact than traditional processes. However, its application relies mainly on the laboratory scale. This condition occurs both because of biological limitations – i.e. long time to degrade pollutants, maintenance necessities, and results in uncertainties – both because of planning and regeneration processes complexity.

The proposed contribution explores the challenges and the first results of a research project that involves universities and authorities to apply phytoremediation in the Milan Metropolitan Area, underlining the importance of interdisciplinarity, participation and dissemination to engage citizens. It aims to investigate phytoremediation potential as a remediation treatment and an integrative approach to urban forestry in degraded areas, with relatively positive effects such as urban biodiversity growth, heat island effect regulation, and green economy promotion.

The research focuses on the Milanese territory, starting from analyzing and identifying soil degradation and pollution; it proposes a methodology to integrate phytoremediation in the complex regeneration processes of closed and abandoned sites to increase urban forests in degraded land. The methodology will develop practical guidelines that will be applied to a selected pilot project.

Study of biodiversity associated to monumental trees in urban forest of Madrid (Spain)

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ABSTRACT

Trees offer numerous ecosystem services, which are recently being analysed and quantified, especially for their value as CO2 sinks, actors in the fight against climate change and generators of health benefits for people living in cities.

Monumental trees are given added value, such as enhancement, shelter and improvement of local biodiversity, but this extent is currently unknown, as integrated studies of all their elements are lacking.

This has been reason enough for the General Direction of Biodiversity and Natural Resources of the Community of Madrid to a comprehensive biodiversity study on four selected monumental trees is justified in order to document an added value to the conservation of this natural heritage.

Four monumental trees have been studied; Platanus x hispanica in the city of Madrid, Populus x canadensis in a small town, Quercus ilex subsp. ballota in agricultural environment and Pinus pinea in forest environment. All living beings associated with or living in each of the trees have been identified, recording the species of fauna, flora, fungi and microorganisms (bacteria, protists), obtaining a list of what is determined in every tree.

The results show a total of about 300 living organisms in each of the trees analyzed. These results indicate the enormous biodiversity asociated to the trees, which is particularly important for their management in the urban forest.

To achieve this task, field sampling has been carried out by using trapping techniques, phototrapping, visual observations, laboratory cultures, optical and electronic microscopy, and DNA collection and sequencing, design and focused properly for each group of organisms analized.

Growth curves for urban trees based on big green data

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ABSTRACT

To aid urban green policy making, it is of vital importance to predict future nature-based solutions as trees grow. To support this goal, reliable growth curves are instrumental. Traditionally, reliable growth curves are mainly available for timber forestry trees. For most urban tree species and cultivars this is hardly the case. As part of the project i-Tree 2.0-NL, we have been working over the past two years, on constructing reliable growth curves, specifically for urban trees down at the cultivar level and based on big green data. We have access to roughly 6.000.000 data points for urban trees, giving information on age, height, stem width, crown width, condition, imperviousness of their growing environment, to name a few. The data was extracted from a combination of different remote sensing data sources, such as stereo imagery and LiDAR and combined with the tree data from 7 different Dutch municipalities. From this data we have been able to model the growth curves for over 60 tree types on cultivar level for both the tree height and crown width. In this presentation we want to discuss our approach, the importance of data quality, and the applications of these growth curves for urban policy making.

Modelling the impact of climate change on individual urban tree level

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ABSTRACT

With climate change having an increasing impact on both the livability in our cities and on urban green within these cities, it becomes of paramount importance to model and the impact of climate change down on an individual tree level. The UN IPCC provides us with the latest and greatest insights into the effects of climate change on our nations, but we need to bring these insights down to the street and tree level, to truly grasp the effects at an operational level. Only when we bring it down to the street level, we can take the right operational decisions regarding tree care and species selection. Bringing climate and climate change down to the street level is not impossible. There is a lot of meteorological and remote sensing information available, depicting the microclimate as-is. Using the IPCC insights, we can extrapolate these as-is microclimates to predictions up to 2090. In this presentation, we want to explain what we have researched over the last years in this respect, where we aim for in the near future and how this can help tree managers and policy makers on making future-proof decisions in urban tree planning.

Tokyo's urban tree challenge: decline in tree canopy cover in Tokyo from 2013 to 2022

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ABSTRACT

Urban trees are vital for climate mitigation and resilience. Despite cities aiming to increase tree cover, many face declines. The extent and causes of the decline in tree cover are often unclear, hindering effective solutions for sustainable urban development. This study contributes to providing insights for global cities to tackle this pressing issue. This is the first study to examine the spatiotemporal changes in tree canopy cover from 2013 to 2022 in the 23 wards of Tokyo, Japan, aiming to clarify the characteristics of urban tree cover and the main factors of tree cover loss. We extract tree cover from satellite imagery using object-based image analysis incorporating spatial analysis of land use data. Topography, historical green spaces and social geography have variously influenced the distribution of tree cover among Tokyo's 23 words. Tree cover declined significantly by 2.0% from 9.2% in 2013 to 7.2% in 2022. Tree cover loss amounted to 38.4% on public land and 57% on private land. The highest percentage of tree cover loss occurred in residential areas: independent houses (39.8%), followed by roads (14.7%), educational and cultural facilities (10.8%), and parks (10.4%). The main factors of tree cover loss are housing developments, urban redevelopments, and the removal of trees in parks and along streets. Tree cover loss in private housing is primarily driven by the development of small detached houses in areas with large houses, gardens, or surrounding forests. This is propelled by a surge in population, leading a higher demand for new housing. Additionally, aging landowners opt to sell their land to save on tree maintenance costs and taxes. Tokyo faces critical issues with tree cover loss and lacks a comprehensive urban forest management plan, risking environmental resilience and sustainability. This study highlights Tokyo's urban forest challenges and provides insights for better urban forest management to foster sustainable urban environments.

Delivering and establishing future trees for cities

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ABSTRACT

Trees for Cities (TfC) is the only UK charity focusing on urban forestry. Our vision "Urban trees for all, by all" is aligned to this EFUF conference. Since 1993, TfC has targeted areas with low tree canopy cover (TCC) and high socio-oeconomic deprivation to improve urban tree equity. Achieving beneficial levels of TCC to match those of affluent places by involving local communities, brings multiple associated benefits and reduces environmental inequality.

We have refined our community–led planning and delivery model in deprived urban areas over 30 years. TfC can demonstrate how we identify critical junctures in planning for lead-in, engagement, delivery and follow-up, and how we target tree planting to urban areas in greatest need.

Lessons learnt

- Delivered for and by stakeholders, trees planted by local volunteers have greater potential to thrive. Planting trees in places with multiple active and passive stakeholders require nuanced approaches, time to plan, engage and procure stock; recognising each location, even in the same town, is unique, needing bespoke responses.
- Future projects will require greater emphasis on establishment, to better understand what a thriving urban forest looks like in different contexts and how this might relate to an unpredictable climate.
- Many British coastal towns have the lowest TCC nationally eg. 4% in Ramsgate. Our coastal programme targeted interventions and produced guidance for local authorities with a framework on how plant, protect and reverse their declining TCC. This Partnership approach can be applied in future programme contexts.

We need to advocate the importance of urban trees, to enable an integrated approach for decision makers and future generations to champion. As a community of scientists, practitioners and activists, we can all reflect and share experiences in local stakeholder stewardship; to ensure recently established trees become part of a thriving urban forest; resilient to an uncertain future.

Exploring relationships: railway ecology and Black locust

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ABSTRACT

Urban environments, heavily influenced by human activities, often exhibit increased levels of plant invasion. This is driven by disturbances and the influx of non-native species. Utilizing these invasive species for ecological restoration, particularly in polluted, early-stage ecological sites, offers a novel approach to environmental management. Railways in urban areas, subjected to various human-induced stresses such as vegetation management and pollution, are ideal setting for studying these dynamics. Black locust (Robinia pseudoacacia L.), an invasive non-native tree species in Europe, is commonly found along railway tracks, either planted for stabilizing embankments or through spontaneous expansion. Our study focuses on black locust's role along electrified railways in the north-eastern Po plain by examining the structural characteristics of black locust stands in relation to soil pollution levels.

We surveyed 42 railway sites, each characterized by varying traffic and functional purposes. These sites were defined as 10 m units along the railway track, with the width determined by the tree canopy's extent. Within each sampling unit, we collected data on general vegetation attributes, tree dimensions, and understory species. Soil and black locust leaf samples were analysed for heavy metal content using ICP-OES.

Our findings show varying levels of heavy metals in the soil at these sites, with the intensity of rail traffic significantly influencing their concentration. Copper levels consistently surpassed the regulatory limits for industrial areas, and concentrations of nickel, lead, zinc, and tin exceeded thresholds for green spaces. Initial assessments suggest that black locust trees are resilient to soil contamination, supporting previous research on the species' tolerance to polluted environments. Further research is required to fully understand the impact of black locust on local ecosystems, especially in comparison to native species.

Ecological and nature conservational role of fungi in urban forests

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ABSTRACT

Urban forests are largely municipally owned and managed with emphasis to societal needs (Rydberg & Falck, 2000; Kowarik, 2005; Konijnendijk, 1999; Ottitsch & Krott, 2005; Gulsrud et al., 2018). Due to the lower incentive to harvest wood (Gundersen et al., 2005) and public's preference for mature stands and trees (Gundersen & Frivold, 2008; Edwards et al., 2012), urban forests harbor more veteran trees than rural forests (Gulsrud et al., 2018). Small-scaled management regimes provide opportunities for fine-tuned consideration of biodiversity values.

The biodiversity of mycorrhizal and wood-inhabiting macrofungi is declining, and many species are threatened in forests. Urban areas can serve as an important zone for maintaining mycorrhizal and wood-inhabiting macrofungi by promoting a high heterogeneity of land use, ownership, and a high diversity of woody species (Purahong et al., 2022).

In Ljubljana, Slovenia focusing on the Tivoli, Rožnik and Šiška hill Landscape Park we have coorganized the 4-day meeting of field mycologists »Ecological and Nature conservational role of fungi in urban forests« since 2021. The meeting is organized in cooperation of Slovenian Public Utility JP VOKA SNAGA d.o.o. with Department for forestry and renewable forest sources at Biotechnical faculty University of Ljubljana and Forestry institute of Slovenia. Alltogether mycologists have observed and determine 412 species of Fungi and 7 species of true slime molds (Protozoa). 5 species are enlisted on Slovenian Red list of Fungi, those are Artomyces pyxidatus, Fistulina hepatica, Ganoderma pfeifferi, Grifola frondosa and Pseudoinonotus dryadeus. Since 2021 more than 10 species of Fungi which are all new records for Slovenia have been found!

Although the importance of fungi is essential in practically all living environments, their role in ensuring the resistance, stability and vitality of forests is crucial.

Why is considering fungi so important for succesfull management of urban forests?

Interactions between development stages and sites (park vs. street) differently influenced soil respiration of exotic and native urban oak trees

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ABSTRACT

The differences in soil respiration (Rs) among trees inside forests of different species and ages are known in some forest ecosystems. However, there is limited research on how tree age and species influence Rs in cities. This study, for the first time, examined Rs in contrasting urban habitats (park vs. street) and how Rs vary between species origin (exotic vs. native), and tree development stages (DS: juvenile, mature, and decaying trees). We hypothesized that Rs values would differ between locations but not between the native pedunculate oak (Quercus robur) and exotic red oak (Quercus rubra). Additionally, we expected a decrease in Rs with advancing DS. The study involved 60 trees evenly distributed across three DS in Karlsruhe city. We used LI-COR Smart Chamber with the LI-870 CO2/H2O Analyzer. Light availability, imperviousness, soil properties, tree size, and vitality were measured. Direct influences of site, species, and DS on Rs values were negligible, but the interactions between site and DS influenced Rs. However, park-trees tend to have higher Rs values than street-trees. Park-trees in decaying stages showed a significantly higher Rs value than street-trees. The Rs values of Q. rubra tended to exceed those of Q. robur. Young juvenile Q. rubra trees had significantly greater Rs than Q. robur. Rs increased significantly tree size in Q. robur at the parks. Park locations exhibited significantly higher soil moisture and nitrogen abundance than street locations. These factors enhanced Rs, suggesting that environmental conditions in parks may contribute to a higher level of Rs. Our findings indicate that the growing site of the tree, species, and size can have a combined effect on Rs in urban ecosystems. More long-term studies replicated in multiple cities are needed in this field to improve arboricultural and urban silvicultural management practices so that urban green space does not become a net source of CO2 emission but acts as a sink.

Causes and intensities of sanitary felling of forest trees in the urban forest of the city of Zagreb

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ABSTRACT

In urban forests, sanitary felling has the function of removing damaged, declining and dead trees. The aim of the research was to determine the number of trees in sanitary felling according to the causes. The research was carried out in an urban forest with an area of 370 ha. Data on sanitary felling were collected for a period of 28 years for the sessile oak, common beech, common hornbeam and black locust. The causes of sanitary felling are dead trees, declining trees, damage to the trunk and/or roots, and wind damage. The intensity of sanitary felling is expressed as (N/ha). Data on climatic elements were collected for the station Grič. Dry season water deficit is calculated as the difference between precipitation and potential evapotranspiration of the given month. Data were statistically processed with Kruskal-Wallis, Mann-Kendall test and Spearman correlation. For sessile oak, the highest intensity of sanitary felling was 7.75 N/ha on average for declining trees, and the lowest was 3.45 N/ha for dead trees. In common beech, there was the most windbreak, 7.26 N/ha, and the least number of declining trees was 2.32 N/ha. In common hornbeam, there were the most declining trees, 6.64 N/ha, and the least dead trees, 2.89 N/ha. For black locust, the highest intensity of sanitary felling was after the windbreak, 17.52 N/ha, and the lowest was 10.12 N/ha on average for declining trees. There was a significant trend of an increase in the number of trees in sanitary felling in the case of sessile oak and black locust. The number of trees in the sanitary felling of sessile oak significantly increased with the age of the trees (r=0.21*), while for black locust this correlation was negative (r= -0.25*). For all tree species, a significant and positive correlation of damage from windbreaks with wind speed was found. Dry season water deficit in July and August had a significant effect on the dieback of the sessile oak and black locust.

"Home of Nature": participatory co-design project tailored on the community's groups for the regeneration of an urban green space

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ABSTRACT

In the town of Sesto Fiorentino (Florence, Italy) is located a derelict green space (2.5 ha) resulting from the construction of the tunnel of the high-speed train which occurred 15 years ago. Currently the area is facing a succession process and counts many small-size trees of different species (mainly Ulmus minor., Ailanthus altissima., Populus nigra L.).

The management of the area has been recently assigned to the local association GIAN (National Group "Friends of Nature") which has the objective to make the green space accessible and fruitful to the local community. Since 2022, a participatory process has been involving the local community in a co-design project with participatory formats tailored to different groups (e.g., members of local associations, citizens, teachers, students and researchers) and aimed at identifying needs and requests. Focus groups were organised with local associations applying an active listening approach. Additionally, two open days at the green space with game-based co-design activities were organised for the citizens as well as a contest "The ideal green space" for schools. The three formats successfully gathered ideas on destination use of the green space i) associations, schoolteachers, and parents proposed an open space for outdoors activities for children ii) elders and families envisaged a place to relax and to practice gardening iii) researchers suggested the creation of a research hub for monitoring transformations and ecosystem services in an urban context. All the groups provided several specific ideas to address their own needs (e.g., meadows, food forest, community garden, green maze, wood-made playgrounds etc.). The most feasible ones were then selected to be realized in the next future.

What do teenagers value about green spaces?

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ABSTRACT

Nowadays, policy makers and society are increasingly aware about the need of climate change mitigation and adaptation actions, and many European administrations are implementing mitigation strategies based on extensive tree planting campaigns. We believe that the extent to what these trees offer direct benefits to the local community depends on the capacity of the community to directly exploit these green resources. It is well known that contact with nature brings positive effects on human mental health and wellbeing due to the stress reduction capacity and the psychological restoration, although these benefits might be short-term. In this study we aim to assess what a specific group of citizens, teenagers, values in urban green spaces, by collecting their opinions on green spaces through a questionnaire.

Through a participatory approach, we have developed a survey tool together with 10 students of the high school Scientific Lyceum N. Copernico (age: 17) in Prato, Italy, with the aim to identify the essential characteristics that an urban green space should have to be used and appreciated by young people, the negative aspects or disservices that might discourage their use and which are the benefits (e.g., sentiment, restoration, wellbeing etc.) they perceived in green spaces. Data will be collected in February by distributing the questionnaire to all the students of the school (age: 13-18) and the results will be presented at the conference.

Exploring the development of community parks in urban-rural fringe areas in China: stakeholder perspectives and strategies for sustainable planning

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ABSTRACT

Community Parks (CP), as a key category of urban public parks (UPP) in Chinese planning, play a vital role in improving residents' quality of life and well-being, enhancing the liveability and ecology of the regional environment, and promoting sustainable urban development for cities in China. Consequently, CPs are considered by many to be integral components of the 'community'.

The ongoing process of urbanisation and the rapid expansion of city form have promoted an increasing number of people to relocate to Urban-rural Fringe Areas (URFAs), leading to extensive new development and an increased pressure being placed on ecosystems in these locations. Real estate construction thus remains a primary development objective within China and the impact on the physical environment of URFA will be extensive.

Through a combination of literature review and field research, this paper explores the development of socio-economic and ecological values associated with CP investments in URFAs in China. It assesses diverse stakeholder perspectives, including governmental officials, experts, and residents, regarding the concept and function of CPs, and analyses factors affecting their planning and construction. The research highlights how varied stakeholder understandings of CP directly impact on design, development, and management. To promote the construction of multi-functional CPs in URFAs, we propose a series of characteristics that need to be considered in future developments.

These insights offer an evidence-based reference for decision-makers, aiming to better meet the requirements of residents and support the development of urban sustainability.

Keywords: Urban-rural Fringe Areas, Community Park, China, Planning

Addressing societal and climate pressures in urban forest recreation: a comparative study of Vienna and Zurich

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ABSTRACT

Urban forests face numerous challenges, ranging from ecological issues such as adverse climate change impacts to social factors like high demands for recreation. Vienna, with a population of around 2 million, and Zurich, with 500,000 residents, both experience population growth and increasing tourism, which intensifies pressure on their forested areas. Forest managers grapple with balancing recreational needs amidst urbanization, leading to overcrowding and conflicts over the ecosystem services that urban forests provide. Emerging recreational activities like mountain biking exemplify these tensions in forest use. This study investigates the struggles over recreational use, particularly illegal Mountain Bike Trails, and the responses of stakeholders and decision-makers in both cities. Through document analysis and interviews with key actors, including bikers and forest managers, the research traces the origins of these challenges, evaluates implemented solutions, and looks at negotiations for their legalization. Comparing Vienna and Zurich reveals differences in stakeholder compositions, planning approaches, and outcomes. Effective change hinges on organized pressure and cohesive financial strategies. However, the current state of trails may not adequately meet growing demands and technological advancements in the sports sector. Insights from this study inform future efforts to manage urban population pressures on forest recreation.

Keywords: mountain-biking, qualitative study, urban forestry, green infrastructure, conflicts

Planning for sustainable urban development: characterization and valuation of Metro Manila's iconic heritage trees

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ABSTRACT

The preservation of heritage trees goes beyond their botanical significance; these trees are integral to a city's historical, social, cultural, and environmental fabric. This study focuses on Metropolitan Manila in the Luzon Region, Philippines, utilizing geospatial mapping to document 39 heritage tree species, evaluating their morphological characteristics and carbon stock. Samanea saman emerged as the most recorded species (16 trees). Notably, only 38% of these trees are native, with 62% being naturalized species. Quezon City hosts the majority of heritage trees, particularly in urban areas such as avenues, roadsides, and shade trees. The study found that the average above-ground biomass and carbon content of these trees is 23.26 metric tons and 10.46 metric tons, respectively. Extrapolated data suggest a total carbon content of 1,652,680 metric tons, emphasizing their significant role in carbon sequestration for reducing CO2 emissions in Metro Manila. However, the study underscores the need for a holistic urban development plan that extends beyond heritage tree preservation. Collaboration among the Department of Environment and Natural Resources (DENR), non-governmental organizations (NGOs), local government units (LGUs), and academic institutions is crucial to building a comprehensive database for these trees and maintaining up-to-date information on their conditions and statuses. This collaborative effort is essential for addressing the growing need for green spaces in urban areas and achieving sustainable urban development.

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