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Countries need ambitious urban biodiversity targets under the EU Nature Restoration Law

Valentin H. Klaus, Klára Řehounková, Orsolya Valkó, Polina Degtjarenko & Stephanie Schelfhout



The EU Nature Restoration Law could rapidly advance ecosystem restoration also in cities. Yet the law focuses on green cover but ignores the ecological quality and biodiversity of urban green spaces, although these are crucial for making cities truly sustainable. Therefore, countries must now define ambitious biodiversity targets and implement urban ecosystem restoration. We propose nine key actions to speed up this process and mainstream urban ecological restoration.

Urban green spaces (UGS) promote healthy and resilient cities and can contribute significantly to biodiversity conservation^{1,2}. However, ecological degradation and insufficient design reduce many vital ecosystem services and the biodiversity of many of the world's UGS³. This also impairs positive human-nature interactions, which are important for the well-being of urban populations⁴. Unlocking the unused potential by restoring urban biodiversity and combatting the ecological degradation of UGS offers a unique chance to address the biodiversity crisis and simultaneously enhance the sustainability and adaptive capacity of our cities. Yet the ecological restoration of urban ecosystems still lacks implementation. This is why we argue for setting ambitious urban biodiversity targets. We present nine key actions to move beyond just "green" and achieve high-quality biodiverse urban ecosystems for the benefit of nature and people.

Ecological restoration can make cities better

Ecosystem restoration, i.e. the process of assisting the recovery of a degraded, damaged or destroyed ecosystem, is a powerful tool to promote biodiversity and the well-being of local communities. While restoration in a rural setting usually involves a reference ecosystem, which defines the ultimate restoration target⁵, restoration in cities often aims at specific outcomes such as increasing native biodiversity or re-establishing critical ecosystem functions (Fig. 1). Common examples of urban restoration targets comprise remediating pollution, restoration of degraded habitats such as urban ponds and streams, using native species to develop UGS and increasing the ecological quality of urban habitats, for example by adding decaying wood, diversifying the tree composition and installing nesting structures in existing UGS⁶. Since ecosystem restoration produces long-term benefits for biodiversity and local communities, political agenda-setting at the levels of countries, regions and cities is very important to advance implementation.

A potentially powerful new restoration law

The new EU Nature Restoration Law (NRL; EU Regulation 2024/1991) highlights the need to restore a wide range of habitats for their unique biodiversity and ecosystem services. It is the ideal opportunity to tackle both biodiversity and climate crisis while also providing tangible benefits to urban societies⁷. The NRL has received much attention and might become a milestone towards mainstreaming ecosystem restoration around the world⁸. However, although urban ecosystems comprise 22% of the EU's land surface, the law falls short on explicitly considering the ecological quality and biodiversity of UGS. While the NRL acknowledges the detrimental effect of urbanisation on biodiversity (in paragraph 12 of the introductory section) and the socio-economic value of biodiverse ecosystems, specifically including urban ecosystems, the actual targets for urban nature (Article 8) lack ambition. When it comes to cities, the law focuses on preventing a national net loss of urban green space. Notably, a backdoor option was implemented for urban areas that currently have more than 45% green spaces and 10% tree canopy cover: These are exempt from further action (Article 8), potentially to allow for urban development, acknowledging the variable geographical, socio-economic and political settings across the EU. When it comes to future goals of the law, as from 2031, an increasing trend in national urban green areas and urban tree canopy covers to "satisfactory levels" are the only two criteria mentioned. Urban biodiversity and the ecological quality of urban green spaces are not directly addressed in the legislative text of the NRL.

The law misses out on a critical opportunity

Although the law is potentially pioneering and asks for the mapping and monitoring of urban areas (articles 14 and 20), for cities neither the ecological quality nor any biodiversity indicators are clearly mentioned. The lack of specific actions, targets and indicators for urban biodiversity in the law is underwhelming and unambitious because a wide range of urban restoration solutions are already available^{6,9}. Like biodiversity, many urban ecosystem services depend heavily on the ecological quality of UGS and are reduced by pollution, intensive maintenance practices, soil degradation and insufficient protection from disturbance¹⁰⁻¹². Thus the current momentum for ecological restoration, fuelled by increased public and political awareness, should be harnessed to implement robust urban biodiversity targets and action plans that go beyond merely expanding green area and tree canopy cover in cities (Fig. 1). We now call for upscaling and strengthening efforts to restore, improve and conserve the ecological integrity of UGS to create cities that are truly resilient and sustainable.

Why restoration of urban ecosystems is needed

Restoration of degraded UGS not only serves biodiversity conservation and synergistically climate change adaptation^{2,13}, but also enhances

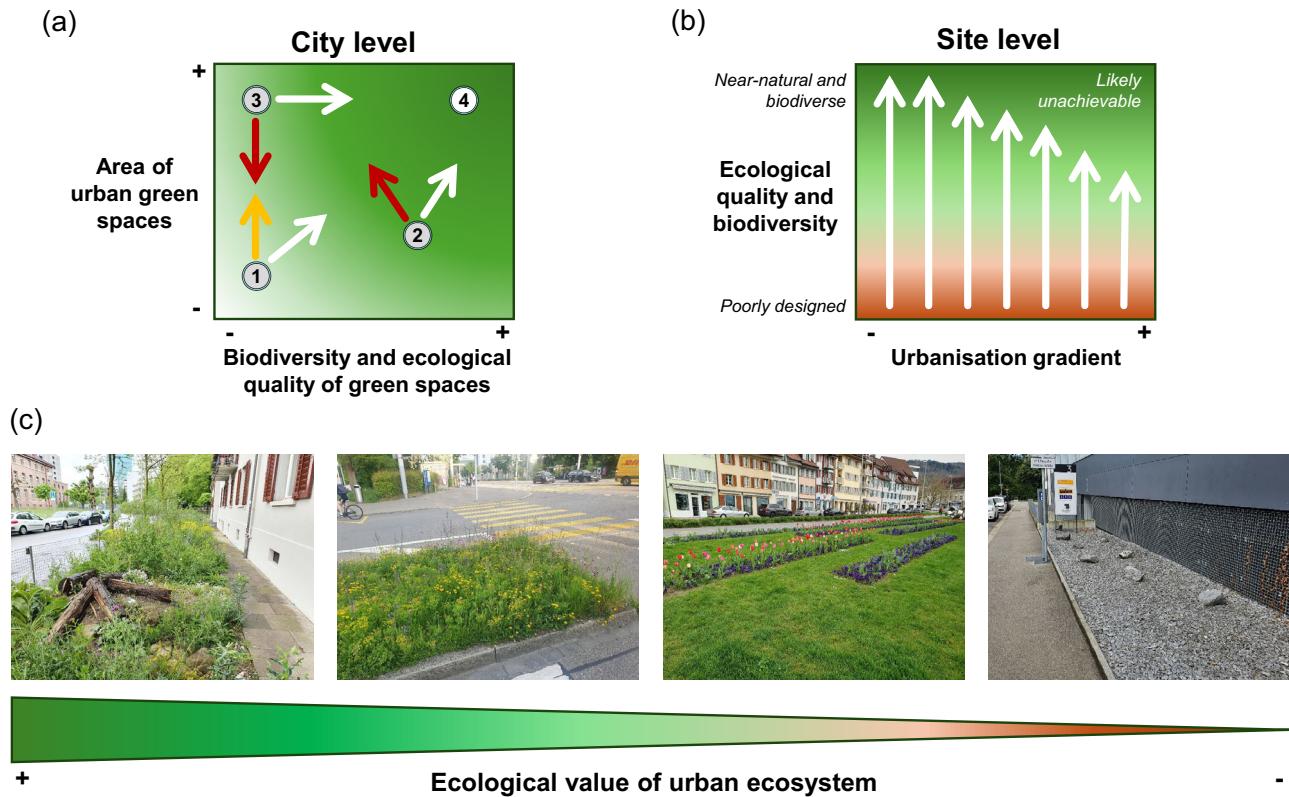


Fig. 1 | Trajectories of the ecological restoration of urban ecosystems at city and site level. **a**, Restoration targets should be set to achieve both increased urban green area and high ecological quality. The white arrows show desired trajectories starting from deficient green area and low ecological quality, whereas the orange arrow depicts the sub-optimal solution of only increasing the green area, as currently suggested by the EU's Nature Restoration Law. The red arrows depict losses in area and ecological quality of urban green spaces, which should generally be avoided, also

in cities with a currently high proportion of urban green space. **b**, Targets of urban ecosystem restoration, namely high biodiversity and ecological quality, need to be ambitious but still acknowledge the prevalent level of urbanisation. **c**, Gradient in ecological quality given for the example of a small-scale linear urban ecosystem, which can be extremely poor in ecological quality (right) but also rich in species and habitat structures (left). Pictures by V. Klaus.

human health¹⁴ and provides protection against natural hazards¹⁵. Firm action should now facilitate improving the ecological quality of urban ecosystems, and many ecosystem services will benefit as well. Reconnecting people with nature in the immediate vicinity of their living and working places will not only support their mental health⁴ but also increase their environmental awareness and sensitivity towards biodiversity conservation issues outside urban areas¹⁶. And there are many more reasons for restoring the biodiversity of UGS. Compared to rural landscapes, urban ecosystems have the advantage that biodiversity restoration is usually not conflicting with food or timber production as they are not under pressure from agricultural or forestry use and have often never been degraded by, e.g., intensive agricultural fertilisation. Moreover, cities have a responsibility to leverage their unique opportunities for species and habitat conservation to counteract the biodiversity loss that is exacerbated by urbanisation and urban sprawl¹⁰. While urban ecological restoration can require substantial investments⁶, cities will receive long-term returns including reduced healthcare costs, enhanced tourism appeal and value gains by delivering multiple regulating ecosystem services. Thus we are convinced that the restoration of urban ecosystems including their valuable biodiversity will pay off in the future.

What needs to be done

In Europe and beyond a transformative approach is needed to quantitatively and qualitatively restore urban ecosystems and include citizens as active participants in this process. EU member states should therefore implement ambitious goals for conserving and enhancing urban biodiversity in their national restoration plans. Because of the obvious chances associated with urban ecosystem restoration, we demand a stop to *grey-washing* of urban habitats, which ignores their importance and justifies superficial interventions. Although urban ecosystems are embedded in a grey context, their current and future value for biodiversity and human well-being should neither be ignored nor underestimated.

To improve the current situation and overcome the lack of urban biodiversity in the NRL, we strongly propose the following nine key actions to speed up and mainstream urban ecological restoration to create genuinely sustainable and biodiverse cities:

- (1) Treat biodiversity as an integral part of cities and make it a fundamental element of UGS management and urban planning at different spatial scales. This concerns all types of natural, near-natural and man-made green spaces.
- (2) Restore UGS to a high level of ecosystem functioning and set ambitious targets for native biodiversity. This can be achieved by giving

preference to near-natural management practices and by actively creating biodiversity using nature-based solutions instead of grey or horticultural alternatives, which often come at similar or even higher costs.

- (3) Urban biodiversity needs to become part of national to local biodiversity action plans in Europe and beyond. The restoration of urban ecosystems, the biodiversity-targeted creation of new UGS and comprehensive ecological mapping and monitoring need to be included as core objectives in legally binding national restoration plans. In addition, cities can set up their own ambitious long-term biodiversity strategies.
- (4) Make cities role models in urban ecological restoration and engage in effective communication of the ecological benefits of biodiverse urban ecosystems to foster public acceptance of near-natural and nature-based solutions. Promoting biodiversity action and education can considerably help to inspire citizens to adopt similar solutions on their private land.
- (5) Provide cities with best-practice guidelines to support the identification and conservation of urban biodiversity hotspots and to facilitate the implementation of UGS restoration under the guidance of experts. Higher-level authorities need to act as multipliers, providing suitable concepts and strategies based on ecological evidence.
- (6) Pay special attention to remnants of original biotopes and protect valuable open and semi-open urban habitats, which can be particularly important for biodiversity conservation. Treeplanting targets must be achieved without compromising existing biodiverse urban ecosystems, because open habitats in cities are already endangered by compensation plantings due to urban development.
- (7) Mainstream the needs of native species by educating and engaging practitioners with ecological knowledge to overcome conventional landscaping practices guided by design instead of ecological functioning. Provide city staff with high-quality trainings on the value and needs of urban biodiversity.
- (8) Complement urban ecosystem restoration with social action such as social housing initiatives to ensure that low-income communities are not displaced by wealthier members of society. This way urban ecosystem restoration can contribute significantly to improving socio-ecological justice and equity.
- (9) Assess the current ecological quality and biodiversity of a country's UGS now, from megacities to towns and villages, to determine the status quo and the need for conservation and restoration action. Protect sensitive areas now.

Now is the time to realise the immense relevance of biodiverse urban ecosystems for nature and people and to exploit the potential that lies in the restoration of degraded UGS. While we acknowledge that urbanisation does often not allow to bring back original nature into cities, ambitious restoration targets still need to aim at high ecological intactness, biodiversity, connectivity and ecosystem functioning (Fig. 1). These goals are worth implementing despite the highly modified character of urban environments^{2,17}. Given the long-term nature of ecological restoration, which also needs to involve diverse stakeholders^{6,18}, it is essential to implement ambitious urban restoration targets as soon as possible.

Inter- and transdisciplinary collaboration between stakeholders, i.e. urban planning, science and restoration practice, as well as between disciplines ranging from ecology to social sciences to public health is key to achieving the highest possible restoration outcomes, which will benefit both nature and city dwellers^{6,10}. Therefore, biodiversity-oriented governance, the facilitation of an open dialogue about ethical challenges related to urban

nature and community engagement are needed to ensure that restoration efforts are sustainable and impactful. Since public support for urban ecosystem restoration is high when citizens understand the benefits of near-natural ecosystems for local biodiversity¹⁹ and ecosystem services, this understanding will also increase the public acceptance of environmental legislation such as the NRL. The NRL is teaching us how relevant the restoration of degraded ecosystems is for biodiversity as well as human life, but now we need to go one step further and include biodiversity in those areas in which the majority of people experience their everyday contact with nature: urban ecosystems.

Data availability

No datasets were generated or analysed during the current study.

Valentin H. Klaus  , **Klára Řehounková**  , **Orsolya Valkó**  , **Polina Degtjarenko**   & **Stephanie Schelfhout**  

¹Institute of Geography, Faculty of Geography and Geosciences, Ruhr University Bochum, Universitätsstr. 150, 44801 Bochum, Germany.

²Department of Botany, Faculty of Science, University of South Bohemia in České Budějovice, Branišovská 1645/31a, 37005 České Budějovice, Czech Republic.

³'Lendület' Seed Ecology Research Group, Institute of Ecology and Botany, HUN-REN Centre for Ecological Research, 2-4 Alkotmány street, 2163 Vácrátót, Hungary.

⁴Institute of Ecology and Earth Sciences, University of Tartu, J. Liivi Str. 2, 50409 Tartu, Estonia.

⁵Forest & Nature Lab (ForNaLab), Department of Environment, Faculty of Bioscience

Engineering, Ghent University, Geraardsbergensesteenweg 267, 9090 Melle, Belgium.

 e-mail: oekologie-geo@ruhr-uni-bochum.de

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Author contributions

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Competing interests

The authors declare no competing interests.

Additional information

Correspondence and requests for materials should be addressed to Valentin H. Klaus.

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