

## PUTTING BIODIVERSITY FIRST – EVEN IN A CITY

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## HOW DID BIODIVERSITY BECOME A CORE ORGANISING PRINCIPLE OF URBAN DEVELOPMENT IN GUIMARÃES, EUROPE'S GREEN CAPITAL 2026?





*Palácio Vila Flor, Guimarães  
© Raven Valentijn*

## Why urban biodiversity?

urban **+** biodiversity

**urban**  
adjective [before noun]  
UK  / 3..bʰn/ US  / 3..bʰn/

**biodiversity**  
noun [U]  
UK  / baɪ.əu.daɪ.vɜː.sə.ti/ US  / baɪ.ou.drɪ.vɜː.sə.ti/



Parque da Cidade  
© Raven Valentijni

From microscopic fungi to forests, “biodiversity” is the collective term for the variety of life and habitats on Earth in all its forms. Urban biodiversity refers to the variety of living organisms and the multiplicity of habitats in and around dense human settlements. Although nature is often more diverse outside of cities, many factors make urban biodiversity important.



*Photo title*  
© Raven Valentijni



*PEGADAS Programme in action*  
© Landscape Laboratory

First, cities offer unique opportunities for learning and education about a resilient and sustainable future and have a large potential to boost innovations and governance tools. Second, billions of urban dwellers are also at high or extreme risk of environmental disaster, and nature is our best ally in combating climate change and enhancing the adaptive capacity of cities through nature-based solutions. Last, but not least, urban environments directly provide good living conditions for various species. For example, with their diverse vegetation, urban environments attract pollinators whose decline – largely caused by intensive agriculture, the most important factor behind biodiversity loss - is a serious threat. Thus, the following features of nature conservation are more or equally important in urban context than in protected areas outside of the cities: awareness-raising through conservation actions, landscaping projects or nature-based solutions, using greening and other nature-based solutions to mitigate the heat-island effects and disaster risks, and the fight against invasive species.

Plants, animals, water and green space stimulate identity and community spirit efficiently, thus they are great tools to mobilise citizens. This is a key opportunity as well as a challenge. Biodiversity-driven green spaces might be advocates of the mindset change required, and besides changing their physical infrastructures and service systems, cities, as the most local forms of governance, can also promote a more pro-environmental attitude of their residents along with urban biodiversity management.



## The secret of Guimarães

*“The best thing we have made in Guimarães so far related to green urban spaces is the establishment of the greenways. Greenways bring people back to nature and people using nature start acting as “spies”. We made the greenways mostly along the rivers, where landowners had to permit it and - in most cases - give a piece of their land where the track is placed now. If the municipality asks it from landowners, they – most likely - say no, but for the Green Brigades, they said yes” - says José Fonseca, the coordinator of the best performing Green Brigade of Guimarães in 2024.*

The so-called Green Brigades have been operating since 2015. Now they are active in 38 parishes (out of 48 parishes in total), covering 70% of the territory of the municipality. This initiative, unique in Portugal, can efficiently stimulate local identity, make the participants proud and satisfied, and provide visibility and training opportunities for participants. Volunteers of Green Brigades have made hundreds of environmental community actions.

*“So, what is the secret behind the high level of engagement?” asked from José by curious participants of the BiodiverCity study visit.*

*“The secret is the continuity. I have been making volunteering for 10 years now... “*

## Guimarães, the European Green Capital 2026

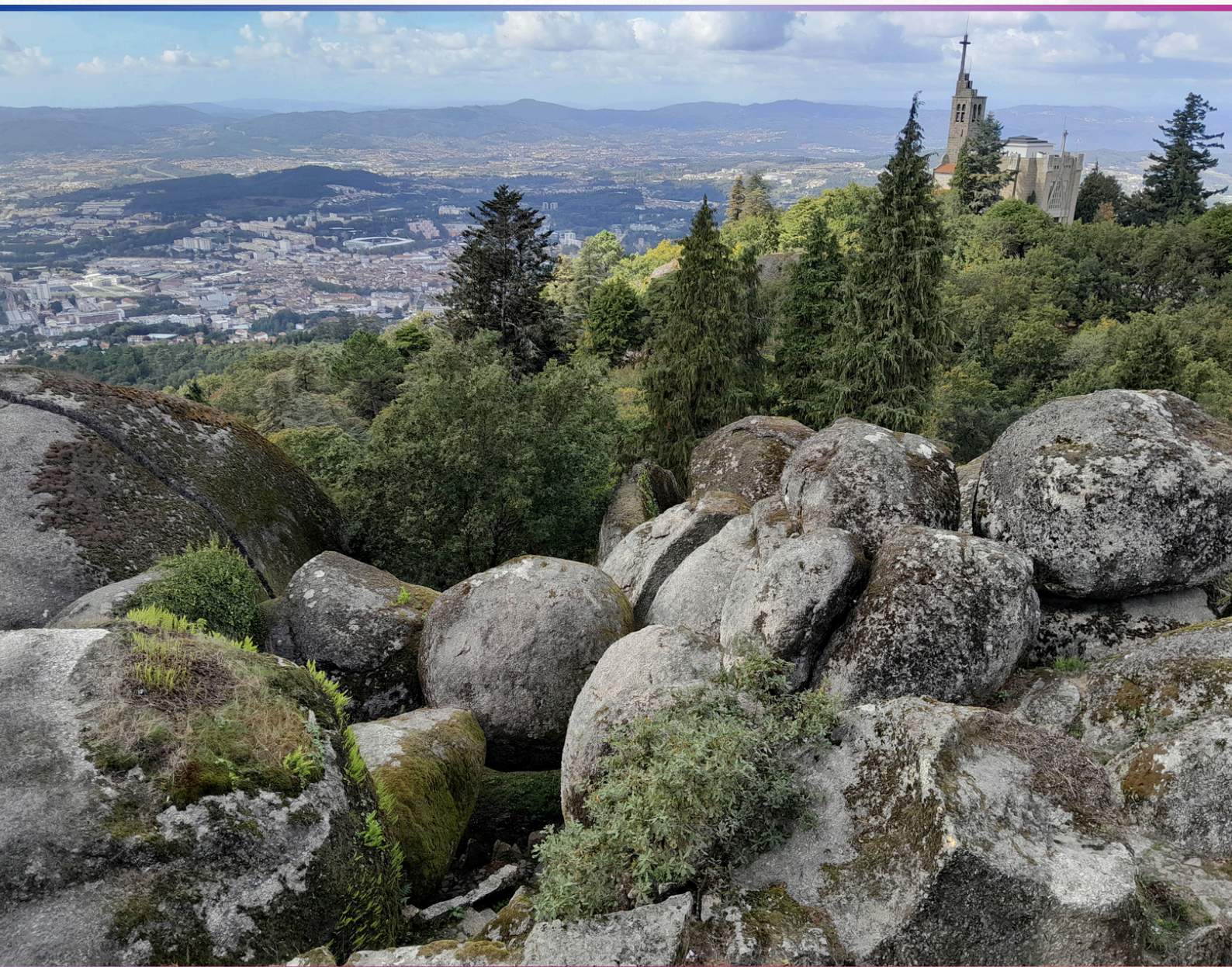
Founded in the 10th century, Guimarães is well known by all Portuguese as the birthplace of the nation. Its historic centre has been part of the UNESCO World Heritage List since 2001 (the area was extended in 2023). *“An exceptionally well-preserved and authentic example of the evolution of a medieval settlement into a modern town, its rich building typology exemplifies the specific development of Portuguese architecture from the 15th to 19th century through the consistent use of traditional building materials and techniques”.*



© Ferenc Albert Szigeti

Guimarães (156.830 inhabitants) is located in the northern part of Portugal, where the Atlantic and the Mediterranean biogeographical regions meet, and where the forests of iconic Penha Mountain, riparian habitats, wetlands and agricultural landscape frame the relatively densely built-in and industrialised urban area, creating favourable conditions for diverse flora and fauna. However, this fact does not explain the high reputation of the municipality across Europe as a green city. The relatively unique (bio)geographical contexts, where urban life is intertwined with a green, biodiverse environment indeed promote opportunities for sustainable coexistence and urban biodiversity initiatives, but hundreds of other European cities have similar or even better natural conditions, and they do not use biodiversity as a core organising principle within urban development and they do not have such a reputation. So, what happened in Guimarães, resulted in the fact that in November 2024 it was awarded as the European Green Capital 2026 (while it was among the 3 finalists of the competition for 2025 and achieved 5th place in 2017 for European Green Capital 2020).

How can biodiversity be such a strong driving force in Guimarães?



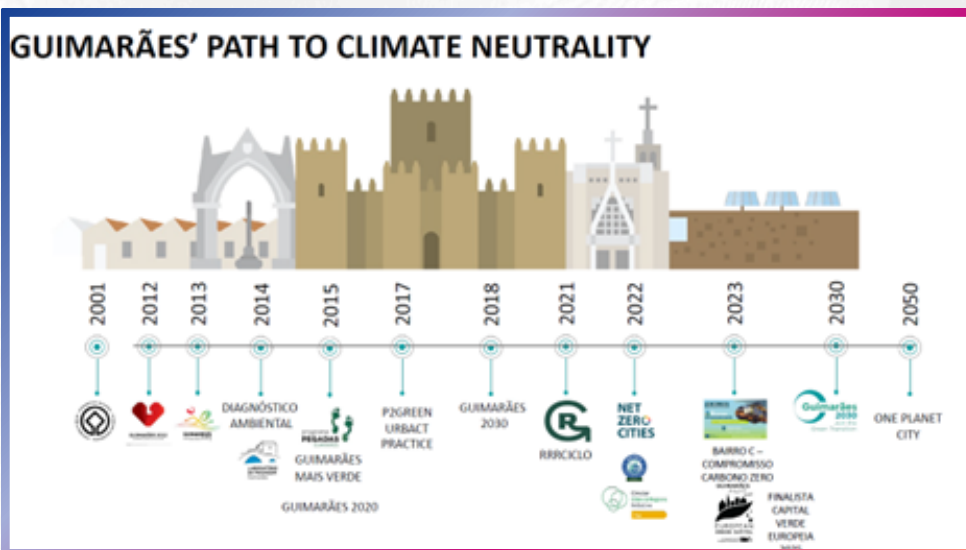
*View from the Penha Mountain*  
© Ferenc Albert Szigeti

## Political leadership

The story started with a vision of the current mayor back at the beginning of the 2010s after the city was awarded the European Capital of Culture (2012) and the European City of Sports (2013). Green issues and especially biodiversity became an integral approach and core organising principle in city development at that time and have been systematically built in all relevant urban planning documents so far.



The result is manifested in national and European recognition: besides the awards mentioned, Guimarães has also been recognised three times as the most sustainable city in Portugal, and since 2018 it has been coordinating the Working Group Green Areas and Biodiversity at Eurocities. Guimarães is proud to be a signatory of the Green City Accord, a European initiative committed to creating cleaner, healthier, and more sustainable urban environments and works on its City Biodiversity Index.



© Landscape Laboratory

## Key tools to put biodiversity first (1): the Landscape Laboratory

One of the key components of the city's success is the establishment of the Landscape Laboratory, a unique centre for environmental research and education, focusing on three main areas of intervention: research and education, project management and communication and environmental training. It was established in 2014 by the Guimarães City Council, the University of Minho and the University of Trás-os-Montes and Alto Douro.



*The BiodiverCity group in front of the Landscape Laboratory*  
© Daniel Ferreira

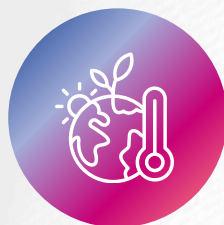
The existence of the Landscape Laboratory makes the city's dedicated effort visible to all and highlights a truly European message to all cities: activating residents along green areas and issues is the role of municipalities in the shadow of the ecological crisis.

## Key tools to put biodiversity first (2): a strategic plan around urban biodiversity and the Biodiversity Action Plan



Along with the establishment of the Landscape Laboratory, another initial action dedicated to the protection of biodiversity was a strategic plan which protects and promotes biodiversity in urban areas. The plan emphasized the importance of native species and fostered environmental education, the use of citizen science and engagement through strong leadership. Later, it was also recognised as a European-level good practice by the URBACT Programme.

The Biodiversity Action Plan prepared in 2023 based on the above-mentioned strategic plan, and the work of the Landscape Laboratory describes the key topics linked to urban biodiversity: mapping biodiversity including the use of citizen science, environmental education, fight against alien species, creation of green corridors, valorisation of natural routes, promotion of species observation, improvement of nature tourism, awareness raising, helping and nudging companies, individuals, and the public sector to minimise their ecological impact. The Landscape Laboratory has 5 thematic focuses: 1. biodiversity and water resources, 2. green areas and land use, 3. circular economy, 4. climate, and 5. health and wellbeing.



Art project next to the river restoration site  
© Ferenc Albert Szigeti

## Guimarães, the city of biodiversity



The high level of engagement of citizens in data collection and other biodiversity-related actions is clearly at the heart of the entire process of boosting biodiversity conservation locally. To engage the local community in conservation efforts and expand data collection capabilities, Landscape Laboratory developed a dedicated app in 2016 (Biodiversity GO!) that allows citizens to participate in surveys and contribute valuable information about species and their locations in the city. Most importantly, this collaborative approach not only improves the assessment of biodiversity but also fosters a sense of stewardship among residents. The city is also very active in organising bioblitz events to activate residents and also participated many times in the global bioblitz City Nature Challenge.

Biodiversity observation  
© Landscape Laboratory



*“Following this recognition, Guimarães seriously works together with parishes to embrace sustainability at the local level, and to share the green commitment with every citizen” – says Francisco Carvalho, General and Innovation Coordinator of Landscape Laboratory. “You have to be able to create an inspirational atmosphere in which collaboration works, top-down and bottom-up initiatives can mutually reinforce each other”. Green Brigades have been operating in this neutral space since 2015 and likely the open and trustful environment is a key factor behind its success.*



*“Education also plays a pivotal role in increasing awareness among residents about the significance of protected areas and green infrastructure”. In line with this, another key action developed in the city at the very beginning of the journey was the creation of the environmental education program Pegadas in 2015. This program includes multiple activities related to urban biodiversity as such, enhancing awareness mostly with younger generations (reaching 83 schools and 20.000*

Community garden  
© Ferenc Albert Szigeti



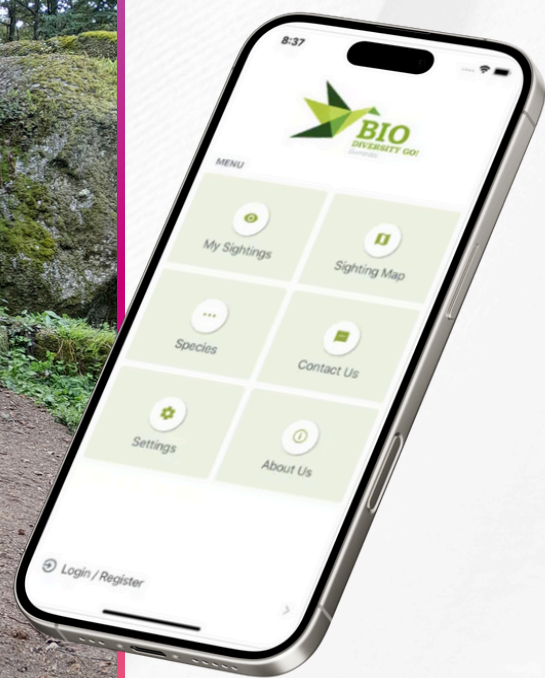


*Community garden  
© Ferenc Albert Szigeti*

students across 48 parishes through more than 900 activities organised per year, including the training of teachers). It also targets the general public through the organisation of bioblitz events, workshops, and festivals like Green Week where young influencers help the work of the Landscape Laboratory. Since 2008 the city also has had a growing community garden, now it is operating on 10 hectares, and it is also a great asset to raise awareness.



It is obvious that by using the Biodiversity GO! app and citizen science in general, residents are more alert to invasive alien species, a major threat to biodiversity.



*Demonstration site on the Penha Mountain linked to the removal of Japanese knotweed  
© Ferenc Albert Szigeti*

Landscape Laboratory also does experiments with new methods to push back these species. On Penha Mountain for example there is a pilot area where they removed not only the local population of Japanese knotweed (*Fallopia japonica*) but the sediments too, then they laid down a biodegradable mesh and planted native vegetation on it to stop the presence of *Fallopia japonica* in an oak forest.

The Landscape Laboratory developed the “Poliniza-te” (pollinate yourself) project in 2021 to promote awareness towards the importance of pollinators and increase the habitats suitable for those species. But this is not only an urban topic in Guimarães, where rural areas can be found next to neighbourhoods. This is not only about planting pollinator-friendly flower beds and awareness raising through organising events dedicated to this theme, just like the Spring Festival in 2022. As the extinction of pollinators is largely linked to the use of pesticides in agriculture, the Landscape Laboratory also operates the so-called Rural Based Incubator to nurture innovation among farmers. Since 2021 the city has been a member of 'Polli.net' (Collaborative Network for the Assessment, Conservation, and Valorisation of Pollinators and Pollination) and actively supports the national "Municipalities Without Glyphosate/Herbicides" campaign.



*Insect hotel at the community garden  
© Raven Valentijn*



Being a tourist destination, Guimarães also promotes nature tourism by developing "Biodiversity Routes" and the future "Guimarães Ornithological Centre", which will help to connect to Portugal's entire natural heritage. The city is also working on creating green corridors. The project aims to create a total of 60 kilometres of green and blue corridors (the greenways) along the Ave, Selho and Vizela rivers. This initiative focuses on improving riparian forests and, if carefully planned and managed for resilience, could provide great opportunities for socio-ecological change and transformation towards sustainability.

*Biodiversity Route on the Penha Mountain*  
© Ferenc Albert Szigeti

In 2021 Guimarães received another serious award: Jardim do Monte Latito, housing three famous national monuments (Guimarães Castle, the Church of St. Miguel and the Ducal Palace of the Bragança), renewed the Green Flag Award (an international scheme recognising and rewarding well-managed parks and green spaces) given in the previous two years, while the city park (Parque da Cidade) was awarded for the first time, as a result of a successful application by the Municipality of Guimarães and the Landscape Laboratory.



*Jardim do Monte Latito*  
© Ferenc Albert Szigeti



*Different grassland management methods in the Parque da Cidade*  
© Ferenc Albert Szigeti

*Photo title*  
© Ferenc Albert Szigeti

The increasingly expanding list of biodiversity-related activities is framed now by the Biodiversity Action Plan, created in 2023. Among others, it strategically aims to restore forests, control the spread of eucalyptus plantations and invasive species, reduce the risk of bushfires and protect natural habitats. It promotes soil diversity and through the Urban Tree Management Office to be established, it will oversee species selection, planting locations, and management practices to enhance biodiversity and ecosystem services. Along with the implementation of these actions, more attention will be paid to the city's climate resilience.



*The protection of urban trees (especially older ones) is an utmost priority in all cities  
© Ferenc Albert Szigeti*

## Guimarães, the city of climate action



*Conservation work and tree plantation with corporate employees  
© Landscape Laboratory*

Another key benefit behind the operation of the Landscape Laboratory is that based on the above-mentioned dedication and leadership to biodiversity, it also provides a better frame for climate action and environmental protection, and thanks to the increased awareness of the general public, residents and companies are more open to that.



*Ponds are important habitats and temperate the air  
© Ferenc Albert Szigeti*

This is manifested in the Guimarães Climate Pact and the various services provided by the Landscape Laboratory behind it. The municipal ecological footprint initiative serves as a guiding framework, steering Guimarães toward becoming a 'One-Planet' city. As a proud member of Zero Waste Europe, Guimarães has pioneered groundbreaking strategies such as the PAYT (Pay-As-You-Throw) system in Portugal and the RRRICLO initiative, which promotes circular economy principles through effective communication and community engagement. The Landscape Laboratory offers to measure the carbon footprint of

companies as well as of the municipality itself and supports companies in achieving their CSR (Corporate Social Responsibility) and ESG (Environmental, Social and Governance) goals through different actions (e.g. public and corporate reforestation, private land consultation). In addition, in 2022 Guimarães became one of the *NetZeroCities*.

Today, the city development follows the principles laid down in the Biodiversity Action Plan as well as in the integrative, multidisciplinary, and participatory Guimarães 2030 Governance Ecosystem (GGE), a dynamic framework with the potential to impact local urban biodiversity conservation efforts.

## A future Guimarães: the city of nature-based solutions

Besides “strictly” biodiversity-related and climate actions, the Biodiversity Action Plan also aims at increasing biodiversity in urban areas through nature-based solutions.

Since nature is our best ally against the negative effects of climate change, the story of urban biodiversity is also about making the city more resilient to them. Increased precipitation is a major threat in North Portugal, thus the city has already established 3 natural irrigation basins as nature-based solutions to reduce the risks of flash floods. Based on the climate models the region of Guimarães, together with the entire Iberian Peninsula will face significant changes in meteorological drought frequency as well, thus water retention will most likely be a key topic regarding nature-based solutions and its complexity has to be tackled in Guimarães too.



*Irrigation basin*  
© Ferenc Albert Szigeti

Thus, like hundreds of cities across Europe, Guimaraes needs a complex strategy for rainwater management and harvesting. Creation of rain gardens and ponds, recovery of water lines and monitoring of their ecological status, increasing the urban tree canopy and planting 3 billion trees by 2030, as described by the Biodiversity Action Plan, are among the actions required behind such a complex “sponge” strategy. The brand-new urban tree regulation of the city, the expanding tree inventory, the Urban Tree Management Office and a Tree Guide to be developed by the Landscape Laboratory can also further support climate goals, including for example heatwaves.



*Photo competition for BiodiverCity partners  
© Daniel Ferreira*

Although a new parking complex (Camões Park) in the city centre was built with an extensive green roof and efficient intervention to control the invasive *Cenchrus longisetus*, and the most recent Local Plan for Climate Action 2030 also fosters the use of green walls, Guimarães, as a frontrunner city, will also need a specific policy to regulate the use of green walls and roofs.



*Camões Park (after the vegetation period)  
© Ferenc Albert Szigeti, Daniel Ferreira*

Another key challenge for Guimarães is to involve private gardens in the broad biodiversity actions of the city and transform “sterile” gardens into biodiversity oases (the city’s great engagement practices from the community garden to the Green Brigades offer a great opportunity for that).

It is time to put nature-based solutions first! Not only in Guimarães, but everywhere – since they are efficient, cheap, aesthetic, and good for nature. There are only a few other cities in Europe, that have such great potential to become a frontrunner of nature-based solutions than Guimarães...

## Have landscape laboratories everywhere!

Besides having such a committed office, institution or unit at a municipality dedicated to urban biodiversity, it would be also essential to create demonstration areas where different nature-based solutions can be explained and showcased. Or as said by one of the Urbact Local Group members in Den Bosch: “*Create a stage to tell the story of climate actions*”. Guimarães has also made a key step regarding this theme: next to the Landscape Laboratory office a small river and its banks have been restored in an educative way, demonstrating various solutions on how to protect riverbanks and their habitats.



*River restoration demonstration area next to the Landscape Laboratory  
© Ferenc Albert Szigeti*

This great initiative should be followed by, at the same area or different areas, telling the story of ecosystem-services provided by forests, grasslands, natural grazing and wetlands, as well as demonstrating the power of natural water retention, agroforestry and soil biodiversity.

Transforming landscapes into laboratories of different nature-based solutions...



“Create a stage to tell the story of climate actions”



*Demonstration of river restoration methods  
© Daniel Ferreira*