



greenminds

greenminds case study

Central Park Sustainable Drainage System



Green Minds Model summary

The Green Minds Model aims to summarise the structure of the GM approach, to aid its transfer and replication to other urban areas and authorities.

Green Minds piloted new ways of implementing nature-based solutions within an urban environment. The project's central aim was to collaborate with stakeholders to recognise how humans, as part of nature, interact with nature in a complex system and to identify ways in which *systemic* change is brought about.

The model is presented as an integrated approach, where various nested elements are shown working together as a system. It reflects the particular challenges and scales of focus in urban areas - from individuals, to communities and neighbourhoods and at a citywide level. It focuses on particular leverage points for change (best practices) with regard to nature in cities, and is guided at its core by a set of underlying principles to inform practice.

At the centre of the model sits the system goal - *Urban Wilding. A set of guiding Principles have been created to inform the practice of Urban Wilding. These principles have emerged from our experiences designing and implementing Urban Wilding in Plymouth.

The eight Principles that have emerged from our programme of testing and development represent key leverage points to effect system change and to successfully integrate nature within urban place shaping. This includes exploring deeply held beliefs and values around our relationship to nature and to others, the creation of new organisational and digital infrastructures which empower citizens, and the development of new policy, planning and financial frameworks to support this.

Complex systems can behave differently at differing scales and so these are reflected too in the model to recognise the importance of understanding *who* needs to be engaged and *how*. This takes into account the need for multiple perspectives and the importance of equity (who participates), through an

inclusive process of engagement from individuals to groups and organisations, and at neighbourhood and citywide scales.

Finally, the model acknowledges the importance of an ongoing and iterative co-design process. This process recognises that resilience requires the ability to adapt as solutions emerge within a complex and constantly changing environment. It is delivered through a cyclical, action learning approach in which lessons learned influence the next cycle of implementation to ensure a progressive approach.

The model is brought to life through our suite of Insight Papers, Guides and Case Studies which aim to illustrate how the model was implemented and what we learnt.

Green Minds Urban Wilding Principles

The quality and quantity of nature has declined significantly in recent decades. Across the UK and Europe, nature recovery and restoration, rather than just preserving or conserving what remains, has become a high priority, as we have become more aware of society's dependence on nature[1].

We know that spaces that are more biodiverse can deliver multiple health and wellbeing benefits as well as other nature-based solutions such as improvements in water drainage, increased carbon sequestration, removal of air pollutants and increased pollination for food security[2]. 'Rewilding' has gained prominence as one approach to achieving such improvements in biodiversity, with a growing research body assessing its impact.

Urban (re)wilding, however, is still a new concept. We define Urban Wilding as 'any initiative, both human-aided and natural colonization, that aims to encourage biodiversity, ecosystem function and native species in urban settings'[3].

Urban Wilding is fundamentally different from wilding/rewilding/renaturing elsewhere. Cities and towns are dominated by human infrastructure and activity. Consequently, many natural ecosystem processes are significantly modified or constrained in urban areas. We rely upon ecosystem services for our health and wellbeing. Urban ecologies, which deliver these ecosystem services, are complex and poorly understood. However, we know that more biodiverse systems deliver more or better ecosystem services. We also know that we can mimic, or engineer, some specific ecosystem services such as storm water management. Whilst we don't know enough to design urban ecosystems to deliver all the services we need, we do know that more nature is good for people and urban living and that arranging it in certain ways can deliver certain specific benefits. We can't achieve this by doing nothing - positive interventions are required, which in turn demand enabling policy, community action and practical delivery mechanisms.

The Green Minds understanding of Urban Wilding recognises the need to shift from nature conservation to nature recovery - to focus on restoring much of what is rare or has gone and a recognition that we need to bring high quality Nature into places where people live.[4]

The Urban Wilding Principles below are designed as a set of prompts to help guide initiatives for nature to thrive in cities: to survive and reproduce, to expand, and to function as a system and so deliver more and better services to support urban environmental health, our economy, and human wellbeing.

*We have chosen to use the term 'wilding' instead of 'rewilding', as it better reflects the reality of nature in urban areas - to rewild implies a return to nature before urbanisation, which is not possible.

[1] Nature Recovery for Our Survival, Prosperity and Wellbeing: A Joint Statement by the Statutory Nature Conservation Bodies of the UK. jncc.gov.uk/our-role/the-uk/nature-recovery-joint-statement

[2] Dasgupta, P. (2021). The Economics of Biodiversity: the Dasgupta Review. London (HM Treasury); Maller, C. (2018) Healthy Urban Environments. Routledge

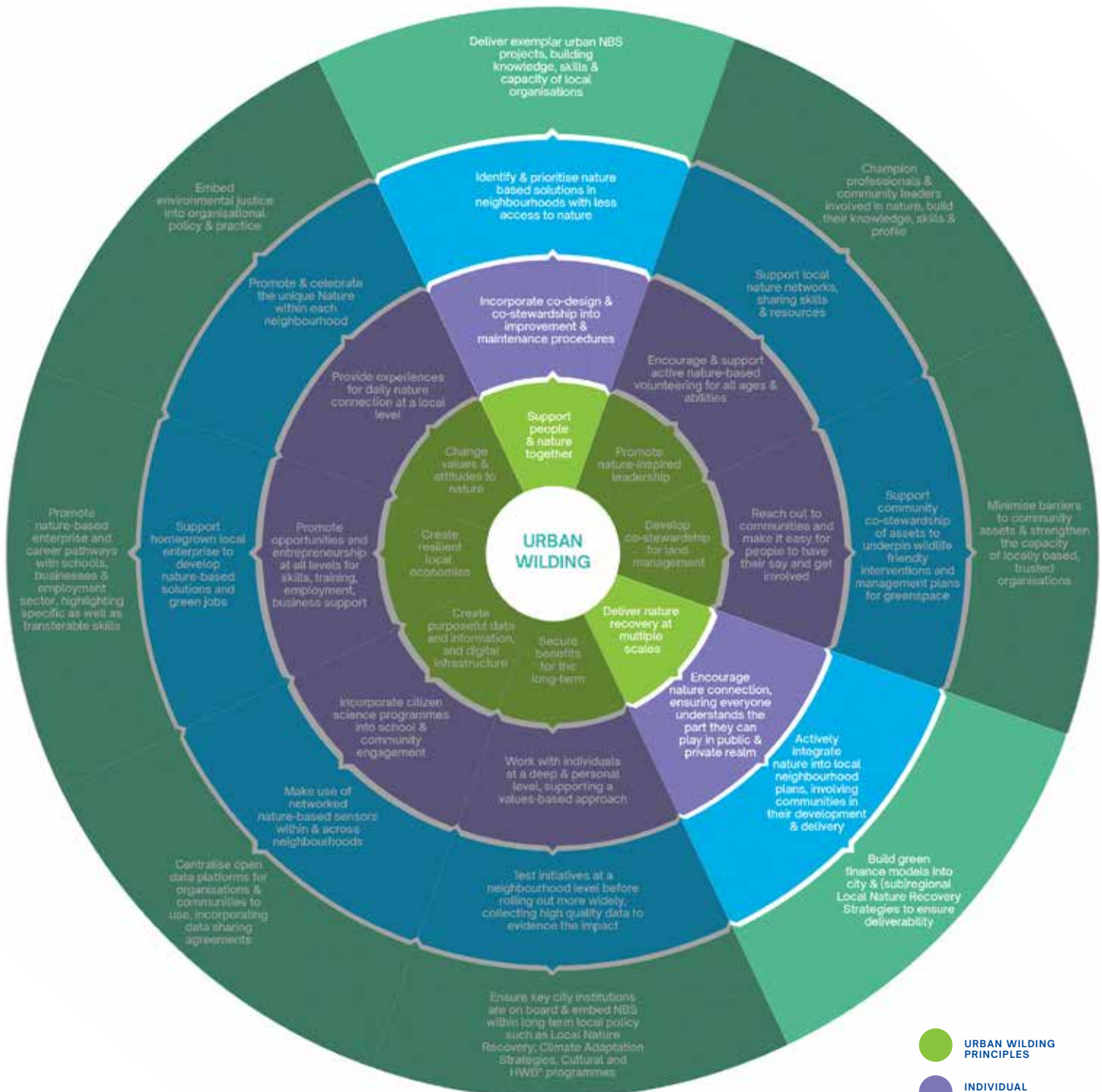
[3] Maller, C., Mumaw, L., & Cooke, B. (2019). Health and social benefits of living with 'wild' nature. Ch 9 in Rewilding. Pettorelli, N., Durant, S., and du Toit, J. (eds). Cambridge University Press

[4] Juniper, T. (2022) Tony Juniper: Green Paper - an opportunity for an integrated approach to Nature recovery - Natural England

greenmindsmodel

The model illustrates the three system levels at which the Urban Wilding principles are applied to drive action: the individual, with neighbourhoods, and within organisations.

Permeability, both within and between segments, reflects the need for adaptability through local learning gained through an action learning approach, in which lessons learned influence the next cycle of implementation.



Urban Wilding Principles

Support people and nature together

Promote a just transition to wilder cities through equitable access to nature, socially just policy and involvement in the co-creation and co-stewardship of nature-based solutions that are adapted to climate change, biodiverse and support nature connection.

Promote nature-inspired leadership

At all levels of management (individual, community/neighbourhood, city administration, business, etc) enable nature positive actions to enhance urban liveability through education, training, and policy.

Develop co-stewardship for land management

Democratise land management and ownership through the development of co-stewardship solutions with user communities, introducing inclusive and empowering processes for engagement, creating community assets, and utilising diverse governance structures.

Deliver nature recovery at multiple scales

Make the most of the local built environment and its scale, acknowledging that no space is too small to be valuable whilst at the same time recognizing that larger green spaces and high degrees of connectivity are key for nature recovery.

Secure benefits for the long-term

Develop integrated policy instruments that embed urban wilding in development practice, led by communities and advised and supported by public administrations to create resilient cities and a population connected to nature.

Create purposeful data and information supported by digital infrastructure

Develop new digital infrastructures to generate community-owned and insightful knowledge of urban nature to support nature connection, and nature-positive policy and practice.

Create resilient local economies

Promote and empower nature-related careers, cooperatives and social enterprise across all sectors, to create new jobs and new value in green and blue infrastructure.

Change values and attitudes to nature

Promote nature connection amongst citizens, to enhance individual and community wellbeing and to foster nature-positive choices.



Sustainable drainage in Central Park

A central aim of Green Minds is to test and demonstrate how urban green spaces can be wilded. This case study represents a demonstration of urban wilding principles in action.

Central Park is Plymouth's largest park. It sits in the upper reaches of one of the city's water catchments. Rainwater draining from the park during rain storms can cause flooding, both in the park and downstream.

This project will transform rainwater from a problem into a resource for wildlife and the community, by using a Sustainable

Drainage System (SuDS) that harnesses the power of nature to control the flow of rainwater and reduce flooding in a changing climate, in a way that complements the natural environment. The project will improve access, conserve heritage features and trees, create a destination space, make homes for wildlife and provide a place to learn about water and nature.



Addressing existing drainage issues...

Currently, the pond and park drainage near the Barn Park entrance do not work meaning heavy rainfall can flood the area and cause drains to overflow making it hard for people to travel through the park. Additionally, runoff from the park contributes to flooding downstream.

At present, defunct drainage and a small pond provide little means of retaining or managing water in the park. This causes localised flooding that affects access during times of heavy rainfall, which is compounded by steep banks and poor ground conditions.

BELOW: Previous flooding in Central Park



...through enhancing wildlife and amenity value

Our solution will collect rainwater into a series of ponds – the existing pond and two new larger ponds – that will hold water all year and will journey here through redesigned granite drainage channels and a new swale.

Central Park Ponds Project



Ponds during dry weather



North pond and landscaping during dry weather



Stepping stone crossing over swale

A **shallow area** of wet grassland with small dams and weirs **will slow the flow** of water and help it enter the ground. Whilst these changes involve reshaping areas of the park and removing a small number of trees, a **large amount** of new planting will help to **capture** rainwater and create a better place for wildlife like bees, birds, bats and frogs.

Raising existing walkways, stepping stones and new viewing platforms with seating will **allow visitors to connect** with these wild areas, and provide space for outdoor learning. There will be opportunities for the community to be involved in delivery of the project.



Design and implementation challenges

SuDS can be challenging to design and install. Not only is it an engineering challenge, in this case it involves change to a cherished park, heavily used by the public. Consents are required and the design must consider wildlife as well as the engineering details of water flows.

Briefly, some of the key challenges were:

Community engagement

Central Park has thousands of users, so multiple approaches were employed to reach the community and wider Plymouth. Due to the technical nature of the project it was important to ensure that messages about the project and its purpose could be easily understood. Consultation incorporated approaches such as community meetings, site assessments, appreciative inquiry and the planning consultation. The community took part in delivery of the project through events like tree planting. Digital tools were employed, explained in the next slide.

Planning consent

Achieving planning consent, while ensuring the project delivered benefits for people and wildlife required balancing competing demands: planning requirements such as biodiversity net gain requirements and improvements to management of surface water (supported by data modelling); consideration of consultee feedback, both statutory and non-statutory (e.g. local community), including retaining features of high ecological value and repurposing elements of the parks heritage within the design; providing protected areas for wildlife to thrive while allowing access for people to experience connection with nature. The success of the design approach has been demonstrated by the project achieving a Building with Nature award.

Engineering a hybrid solution

To achieve the above, this project required a hybrid solution, both inspired by nature and incorporating hard engineered elements (e.g. pipes, concrete outlets). Significant planning and design was needed working with a range of disciplines, from engineers to conservation groups, to find the right balance. To address this particular wilding challenge, a nature-based solution was needed and has been designed so that over time, natural vegetation will mask engineered elements and blend into the park landscape. It was important to explain this process of change when engaging with the community, being clear that while the site might look bare after construction, it will gradually become greener (and wilder) as planting establishes and wildlife inhabits the area.



An opportunity to educate

The SuDS project is very visible in the park, both as a construction project and, once complete, as a new feature in the park. It's a great opportunity to educate the public about nature based solutions and about nature and wilding.

Information

We placed information at the site to explain what was happening and why. We use signs with QR codes that link to websites explaining live data from sensors around the new ponds and its connection to wildlife that can be found. An animated short film (explainer video) was released.

Access

Accessible viewpoints for those with reduced mobility are provided, and there is open access to the water's edge in one area.

Visual interpretation

Students at Arts University Plymouth helped to design interpretation panels to encourage interaction with wildlife and explain the benefits of SuDS and wetland areas.

Monitoring

There are sensors around the pond to measure changes before and after the project, measuring and collecting data such as air particulates and temperature. This will help to evidence the wider benefits of this nature based solution.

Frogs and Dragonflies



This project is co-financed by the European Regional Development Fund, Liffan Innovative Actions Initiative

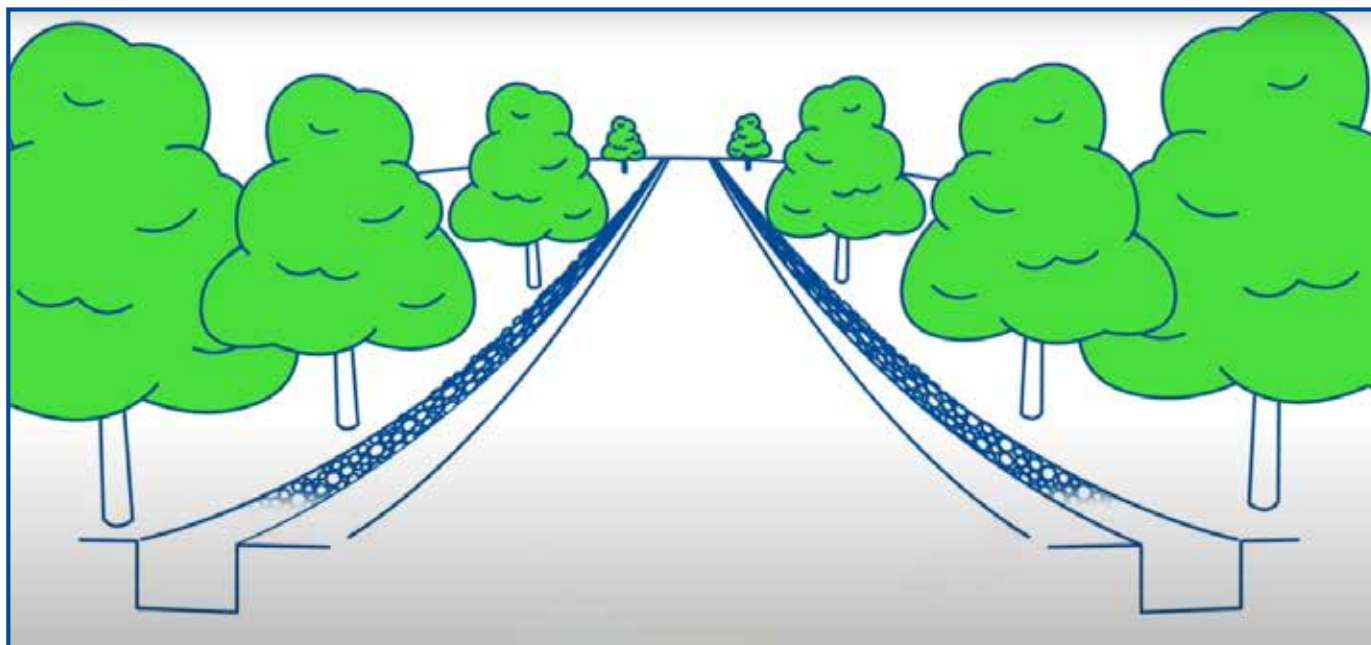
ABOVE: Interpretation for Central Park designed by an Arts University Plymouth student, Hannah Harvey

An integrated programme of urban rewilding

The Central Park SuDS project is one of many underway to improve the wildlife and amenity value of the park.

- 1 **Pounds Park** – celebrate and enhance the features that make Pounds Park special: peace and space, formal gardens, mature specimen trees, networks for nature, heritage.
- 2 **The woodland** – secure the future of the woods, make improvements for wildlife, update management practices.
- 3 **Conservation project for elm trees & White-letter hairstreak butterflies (which rely on elm trees)** – planting trees, nature surveys, habitat creation and management for wildlife, action plan for elm trees and WLH butterflies in Central Park.
- 4 **The old Zoo Field** – designing and delivering a new landscape design to benefit people and nature.
- 5 **Southern slopes area (fields south of the baseball pitch)** – tree planting.

BELOW: animation still of the new drainage system





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