Net Zero Living: Meet The Innovator - Webinar Series

Webinar 4: Biodiversity

28th April 2025

UKRI Innovate UK

Our Purpose & Vision

We are part of Innovate UK, the UK's innovation agency.

We create diverse connections to drive positive change.

To establish a network of innovators so powerful its ideas will change the world.

UKRI Innovate UK | Business Connect

Our Network

46,229
Unique Organisations

72%
Small

15%
Medium

13%
Large

335,478
innovators

Every university in the UK

UKRI Innovate UK | Business Connect

Innovate UK Net Zero Living Programme

https://iuk-business-connect.org.uk/programme/net-zero-living/

A £60 million, three-year programme that aims to help places and businesses across the UK to accelerate the delivery of the transition to net zero.

Two core focus areas

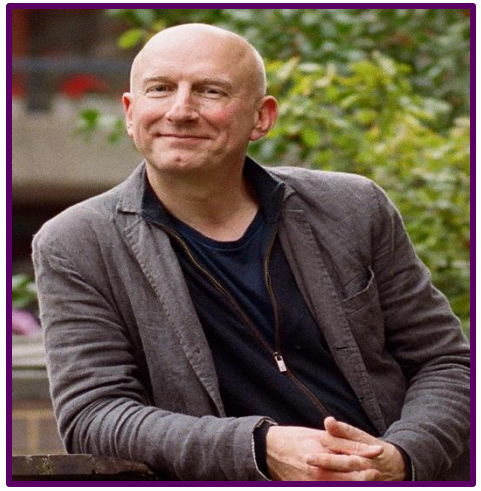
Providing support to 52 local authorities, their partners and communities to overcome non-technical systemic barriers to the scaling and adoption of net zero solutions.

Supporting businesses to better understand and respond to the needs, opportunities and barriers preventing the large-scale roll out of net zero solutions.

UKRI Innovate UK | Business Connect

Dusty Gedge

Gentian



Ross Cameron & Nigel Dunnet

University of Sheffield

Nigel Greenhill

Insure4Nature

UKRI Innovate UK | Business Connect

Gentian

Empowering organisations to understand the truth about nature

Interdisciplinary Design
for the Built Environment panel
Cambridge, 3 April 2025

Our Expertise

Dusty Gedge
Globally renowned green roof and urban biodiversity expert.

Gary Grant
Chartered ecologist advising governments on policy and design codes across the world.

Thomas Fenal
Sustainability and non-financial reporting expert (NFRD, CSRD, TCFD)

Dr. Marcus Spiegel
Remote sensing and AI expert, specialising in urban and rural biomes.

Dr. Olga Tutubalina
Remote sensing expert, specialising in arctic and temperate biomes.

Dr. Eleanor Thomson
Vegetation remote sensing expert, specialising in tropical biomes.

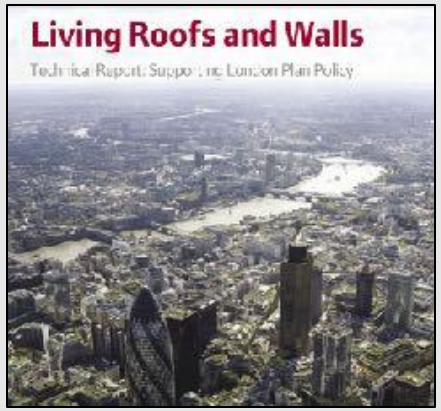
EFB EUROPEAN FEDERATION GREEN ROOFS & WALLS

CIEEM

esa

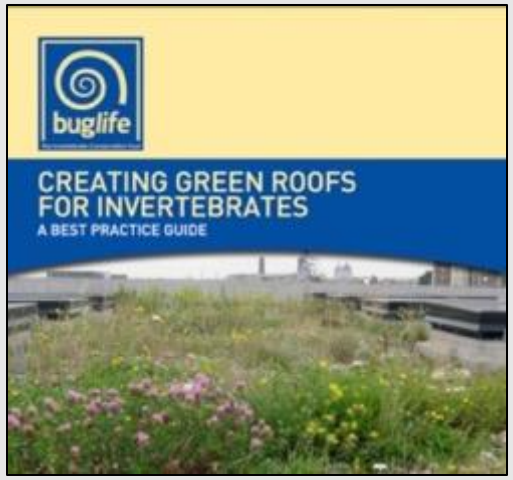
UNIVERSITY OF CAMBRIDGE

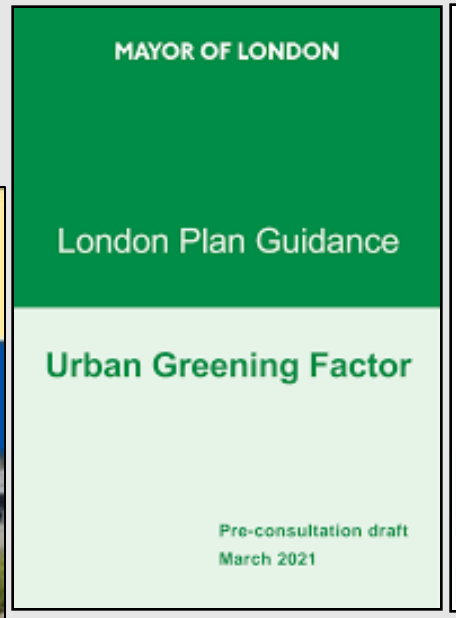
My Expertise

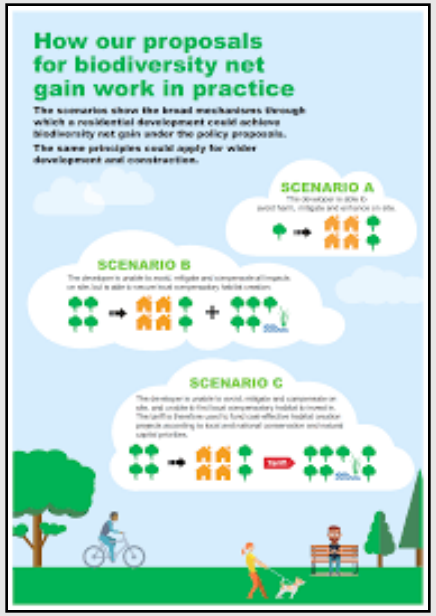


EFB EUROPEAN FEDERATION GREEN ROOFS & WALLS
GREENER CITIES IN EUROPE

gro

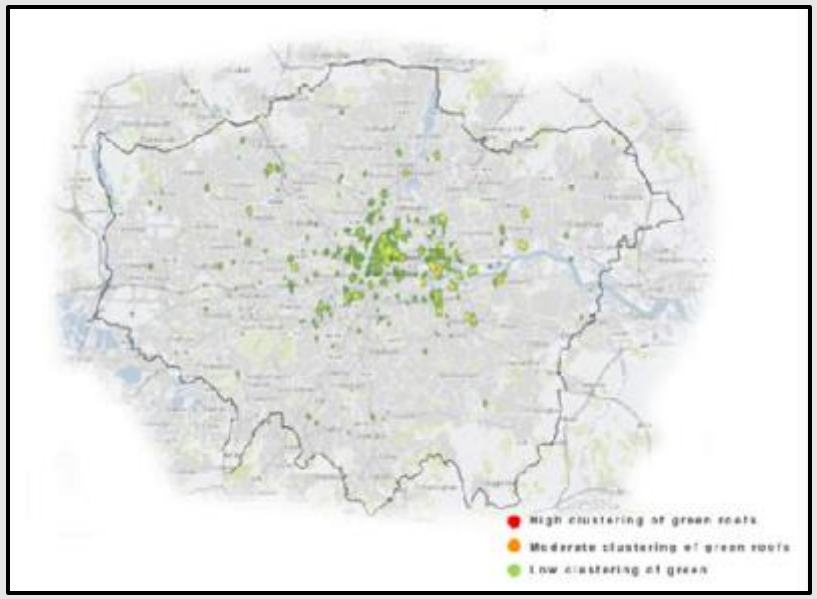


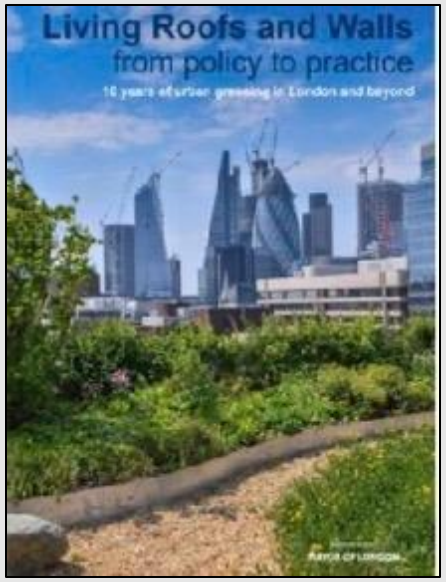


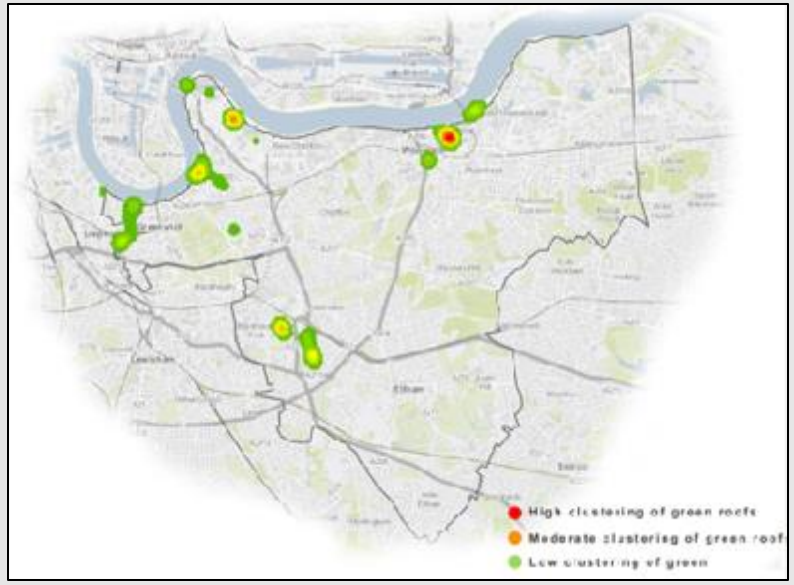


Nearly green roof policy in London - 2008 Greenn roof Policy to UGF & all guidance on green roofs and biodiversity in the UK including BNG metrics for green roofs

Prior to Gentian







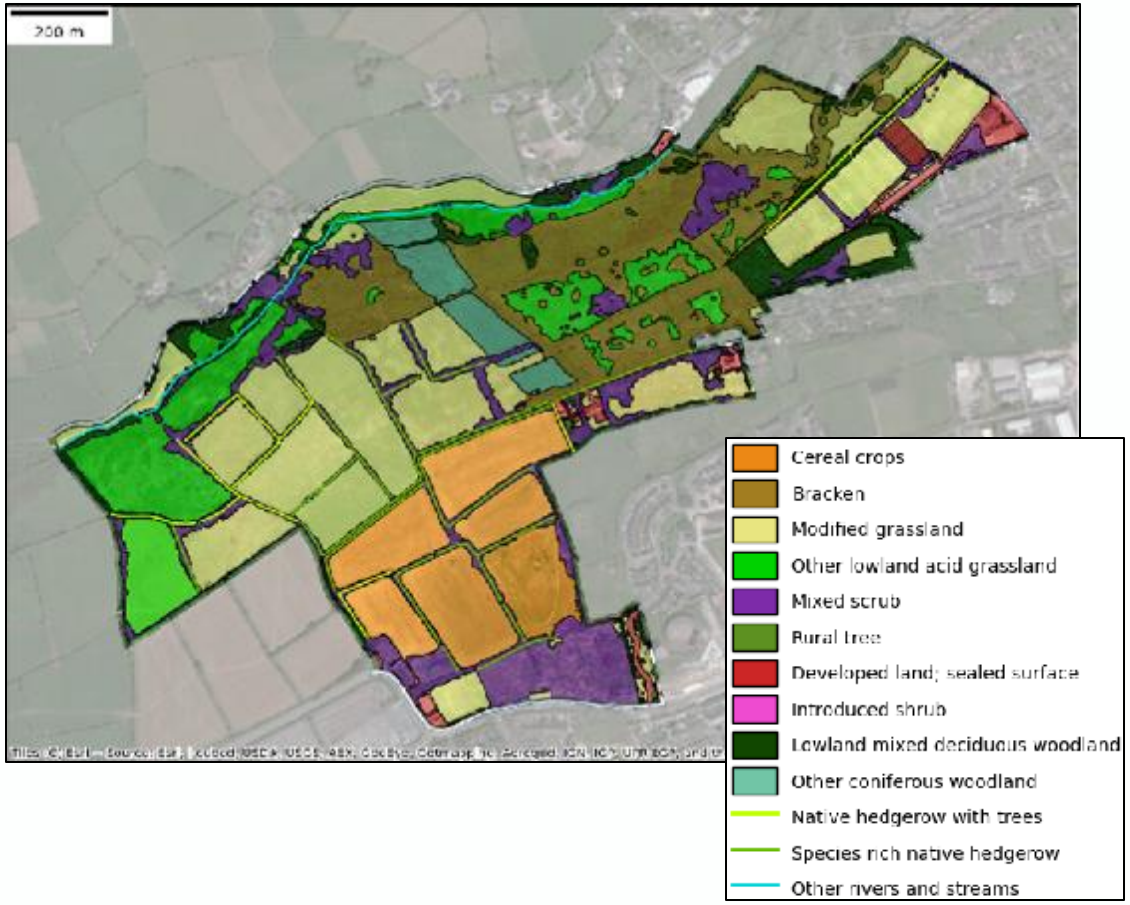
Our Mission

To empower every organization that impacts nature with tools to see and value the habitats they touch in unprecedented ways.

Our solution

+

=



High Resolution imagery (<50cm)

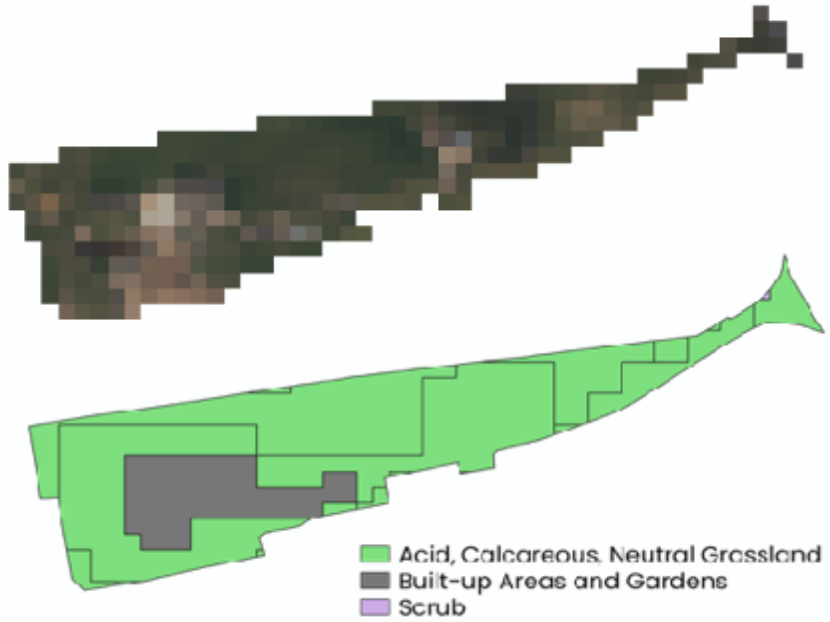
Widely available
Low cost *

Proprietary Deep Learning Technology

Based on facial recognition technology

Resolution matters

Most solutions use freely available 10m resolution imagery.



We use satellite imagery starting at 30 cm resolution, providing greater clarity and insight.

Gentian

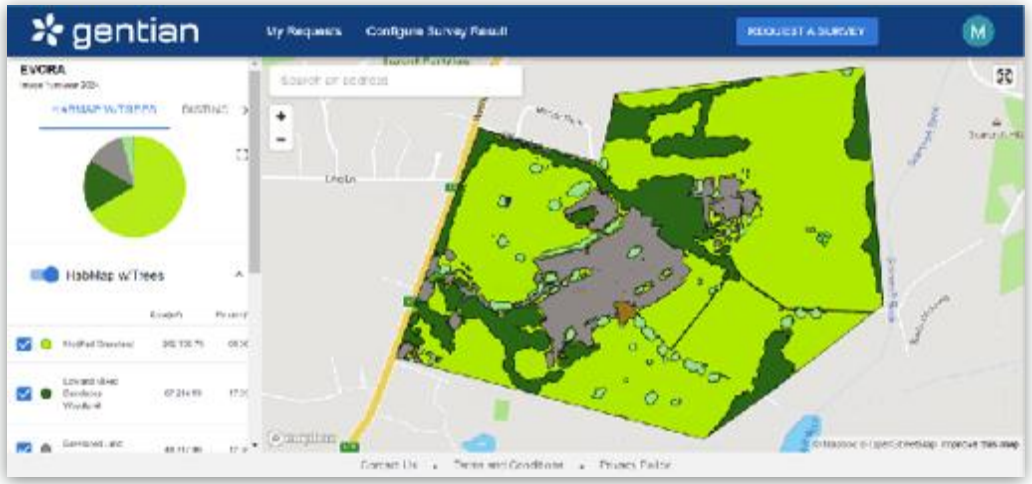
Opportunities for
biodiversity uplift

Granular survey at scale enabling for direct funding where it matters

Baseline assessment

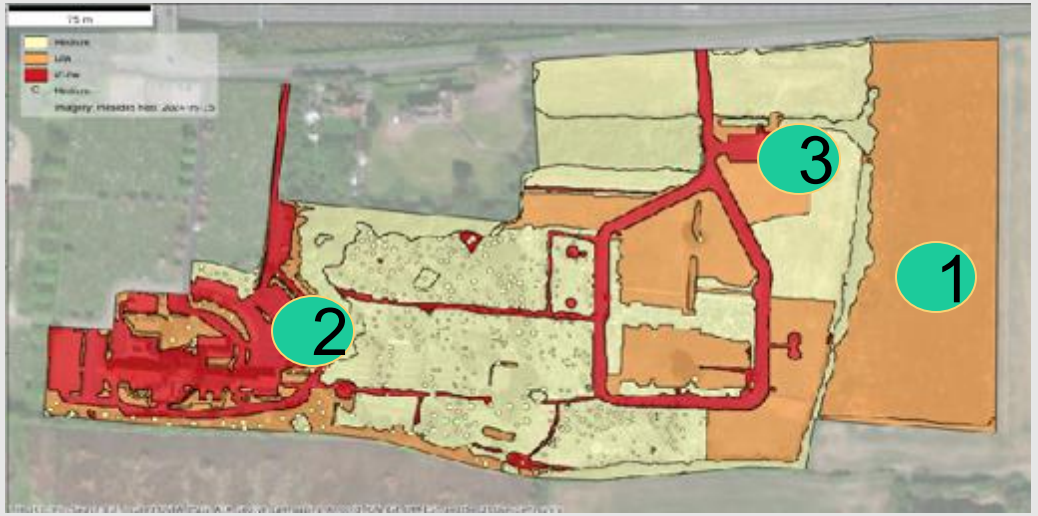
Opportunities for uplift

Online Platform and API



Baseline

494 BU



Uplift potential

1 +42 BU

2 +20 BU

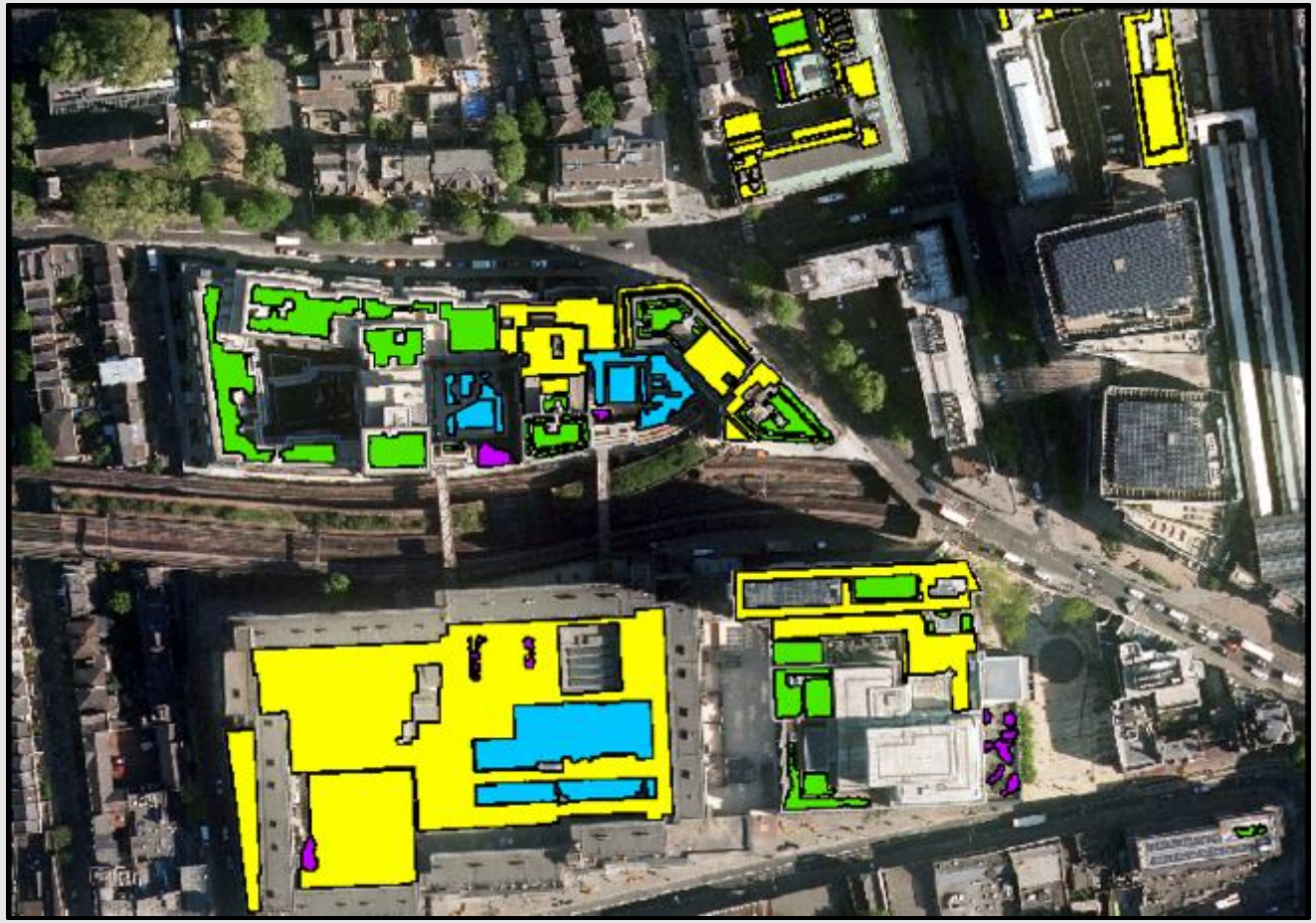
3 +12 BU

Gentian

In cities like London, where space comes at a premium, green roofs are a highly effective way for cities to increase biodiversity and enhance urban climate resilience. However, there is a lack of data on existing green roofs, and retrofit opportunities.

Urban nature uplift
& Climate resilience

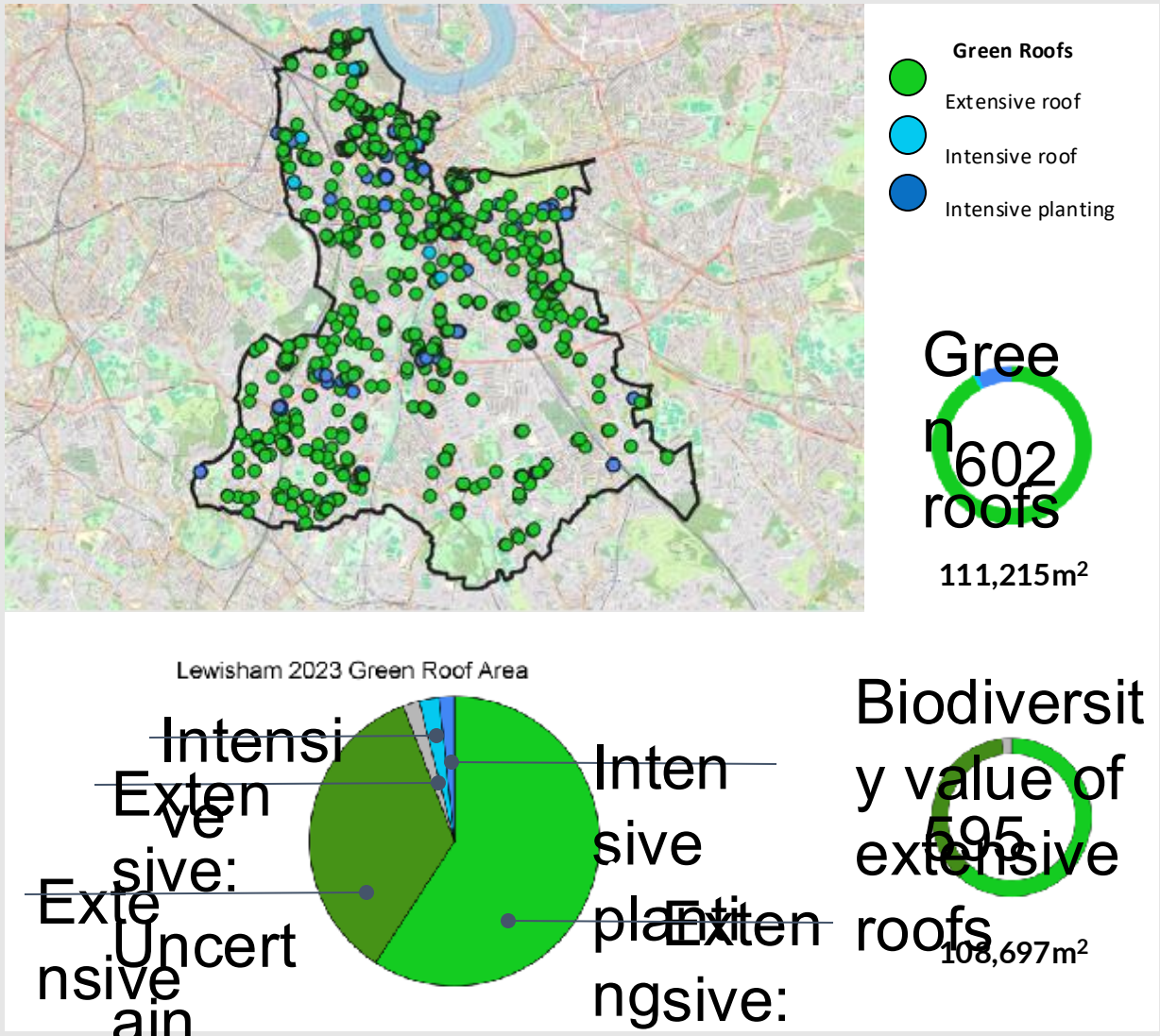
In cities like London, where space comes at a premium, green roofs are a highly effective way for cities to increase biodiversity and enhance urban climate resilience. However, there is a lack of data on existing green roofs, and retrofit opportunities.



Case Study: Lewisham Council

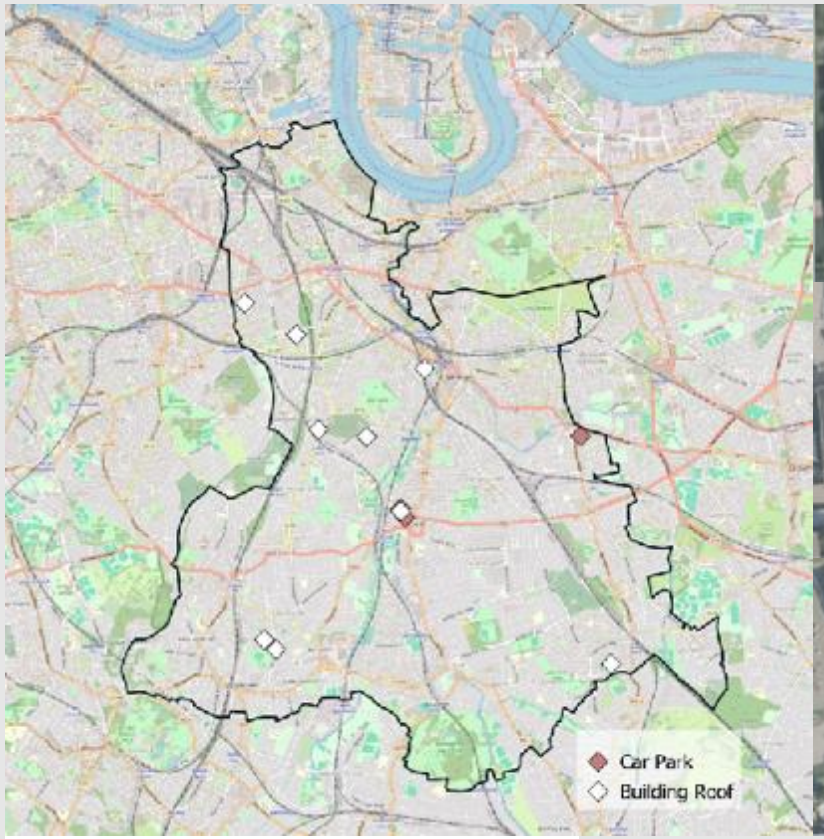
Gentian mapped and classified all the green roofs in Lewisham and assessed it's Biodiversity Net Gain (BNG) value.

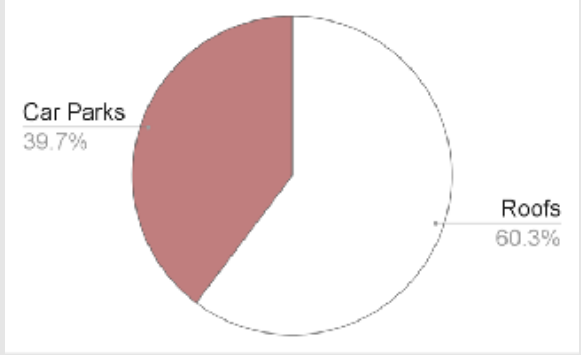
Green Roof ID and Classification



Case Study: Lewisham Council

We offered Lewisham Council additional services identifying roofs that can be retrofitted with green roofs and a bespoke analysis of adopted highways and social housing in the borough.

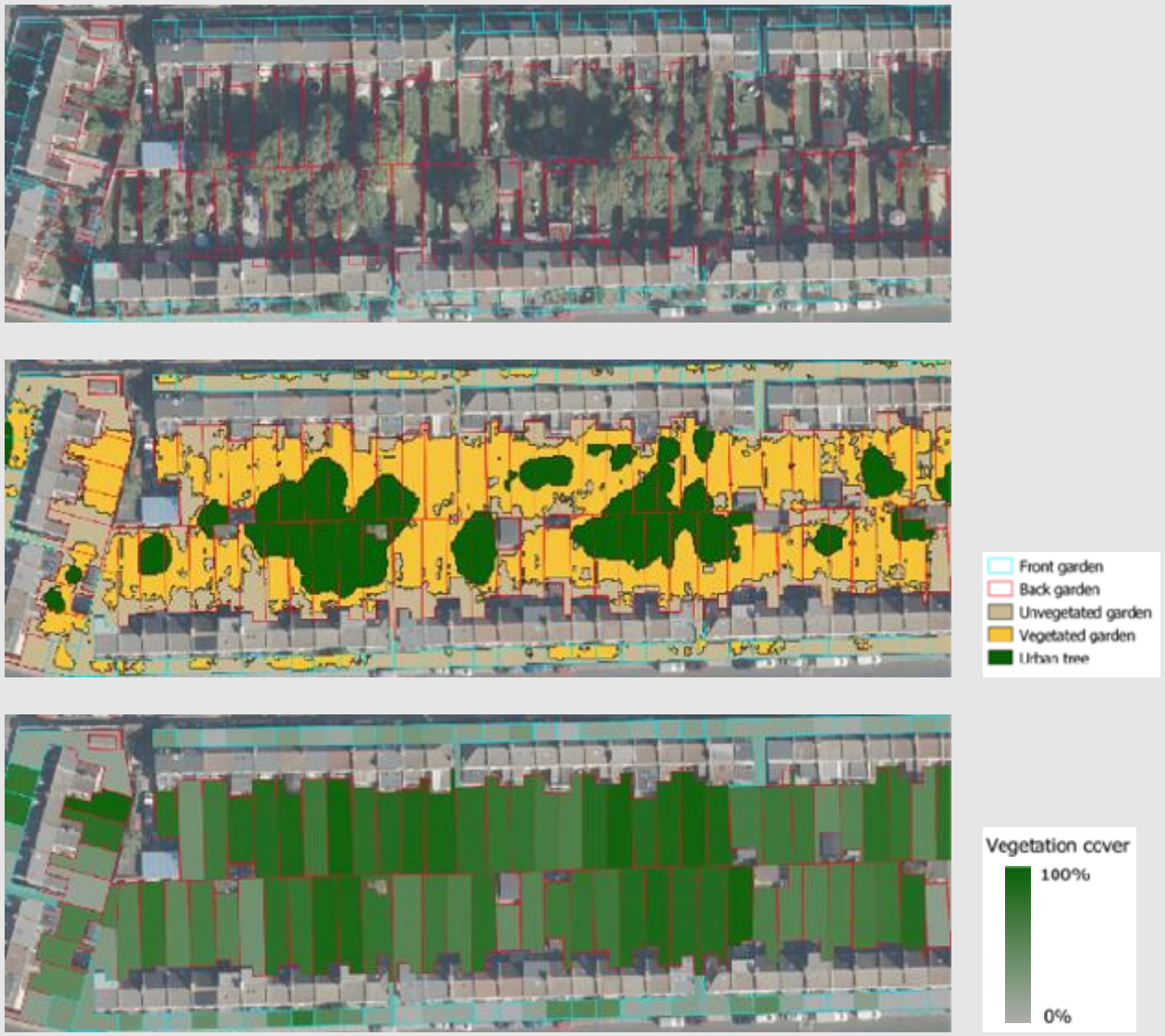




Case Study: Lewisham Council

Private gardens are valuable green spaces that contribute significantly to biodiversity. However, they are largely inaccessible by the council. Gentian was able to map all of the private gardens in Lewisham remotely and distinguish between front and back gardens.

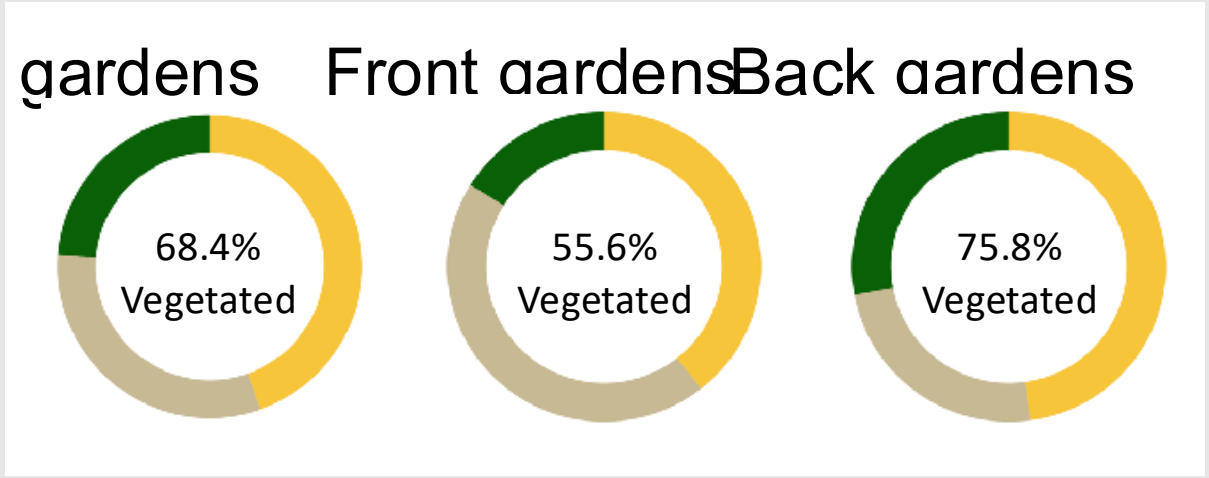
Mapping Private Gardens



Case Study: Lewisham Council

Gentian inventoried green infrastructure assets separately in front and back gardens, to assess potential incentives for increased climate resilience, such as re-vegetating front gardens

Mapping Private Gardens

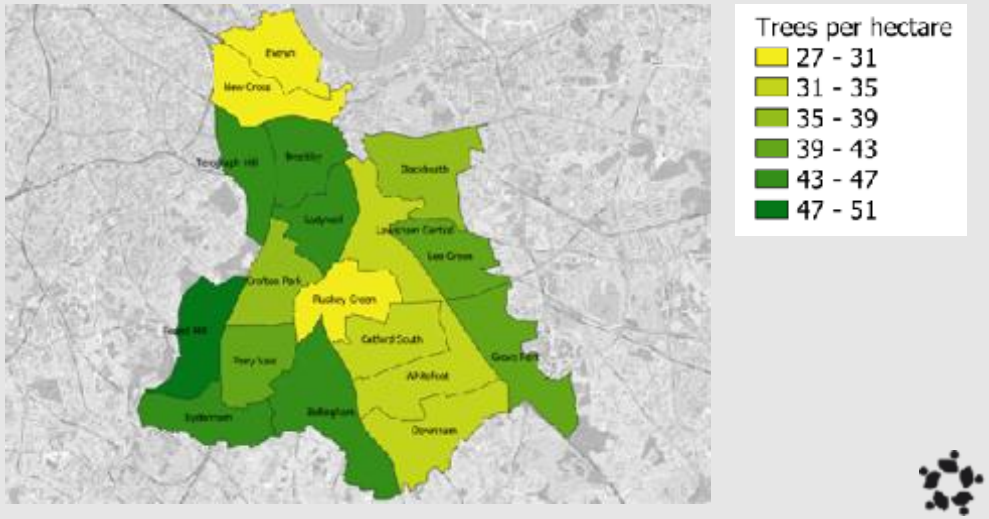


	All Gardens	Front Gardens	Back Gardens
Number of trees	56,854	14,856	40,678
Tree cover (ha)	254	64	183
Vegetated cover (excl. trees) (ha)	477	157	313
Unvegetated cover (ha)	338	177	158

Case Study: Lewisham Council

Gentian conducted a tree count analysis across the borough, breaking down coverage by area and counting trees in individual gardens.

Tree Count and Mapping

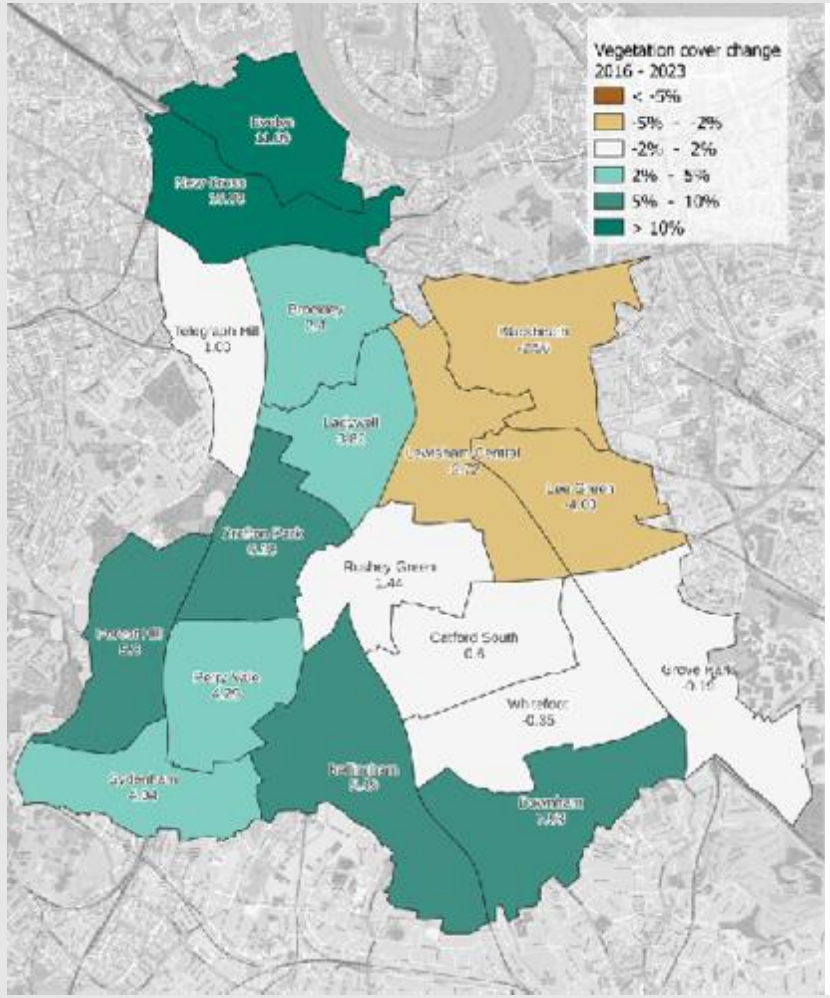


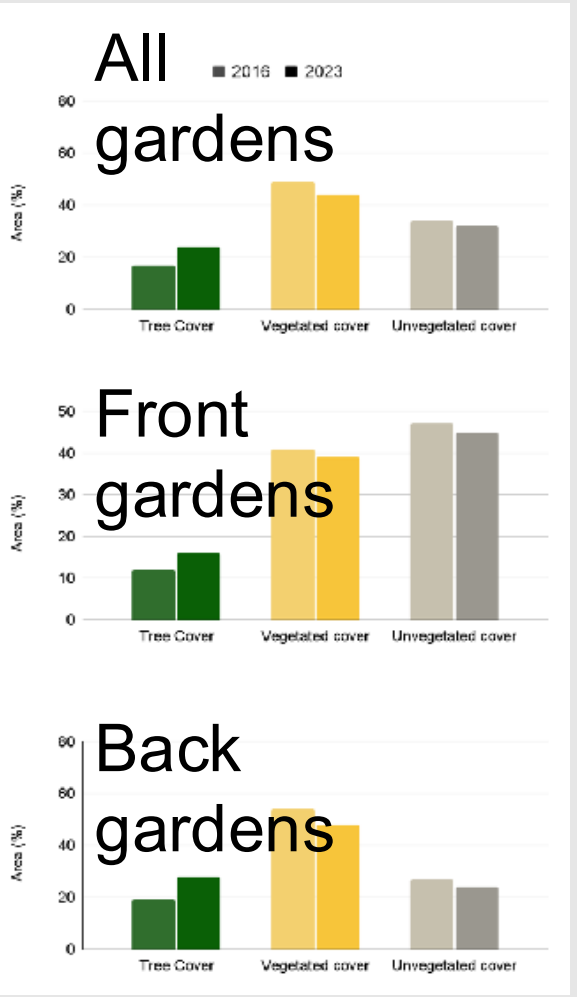
Lewisham

Case Study: Lewisham Council

Gentian analysed change in tree count, vegetated cover, and unvegetated cover between 2016 and 2023 and distinguished between all gardens, front gardens, and back gardens.

Change Detection





Eco-patterns project

Lead by Gentian in collaboration with the University of East London
Focussed on ***ecosystem condition***

Innovate UK

Peatlands

Open Mosaic Habitat

Our Achievements

We are trusted by organisations across the world and recognised as leading innovators in biodiversity monitoring

THE EARTHSHOT PRIZE

Nominee
2024 & 2025 Earthshot Prize

Google for Startups

Alumni
Climate Change Accelerator

uplink

WORLD ECONOMIC FORUM

Top Innovator
World Economic Forum

Trusted by


Google
TotalEnergies
ScottishPower
NatWest
Shell
TNFD
子どもたちに誇れるしごとを。
SHIMIZU CORPORATION
清水建設
UKRI
Innovate UK
esa
MORI
MS&AD
INSURANCE GROUP
HANG LUNG GROUP
ECOLAB
syngenta
idverde
Toutes les solutions sont dans la nature
CITY OF VANCOUVER
MANCHESTER CITY COUNCIL
Lewisham
PLYMOUTH CITY COUNCIL
h&f
hammersmith & fulham
SWIRE
THE ROYAL PARKS
CADOGAN
GROSVENOR
mitie
BARRATT
Balfour Beatty

Gentian

info@gentian.team

gentian.io

Ross Cameron

Professor of Environmental Horticulture,
School of Architecture and Landscape,
University of Sheffield

r.w.cameron@sheffield.ac.uk

About me

1. Research on the benefits (ecosystem services) of urban plants
2. What plants can survive / function in a changed climate

Advisor to

- The Royal Horticultural Society
- Peak District National Park
- Sheffield - Business in the Community Group

The University Of Sheffield.

Nature Has a Right to Exist

- Moral obligation to protect it.
- But even if you don’t take this view
  - we humans fundamentally depend on Nature.

- My research has tended to focus on *nature as a tool* to help solve problems

ITS ALL RELATED !

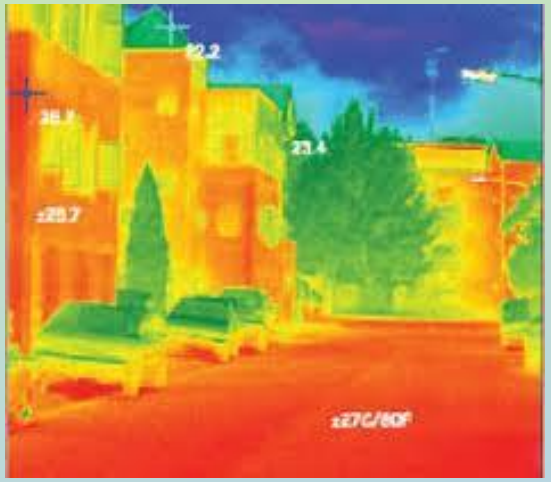
Integrate NATURE with other agendas

(Ecosystem Services)

We need green – its not an option!

Biodiversity

- Our health and well-being
- Better air quality
- Noise mitigation
- Less crime (psychological aggression)
- Social integration
- Dietary improvements
- Economic development – Sense of Place



Climate change adaptation / mitigation

- Reduced urban flooding
- Urban Cooling
- Better energy use of buildings

Nature & Human Health

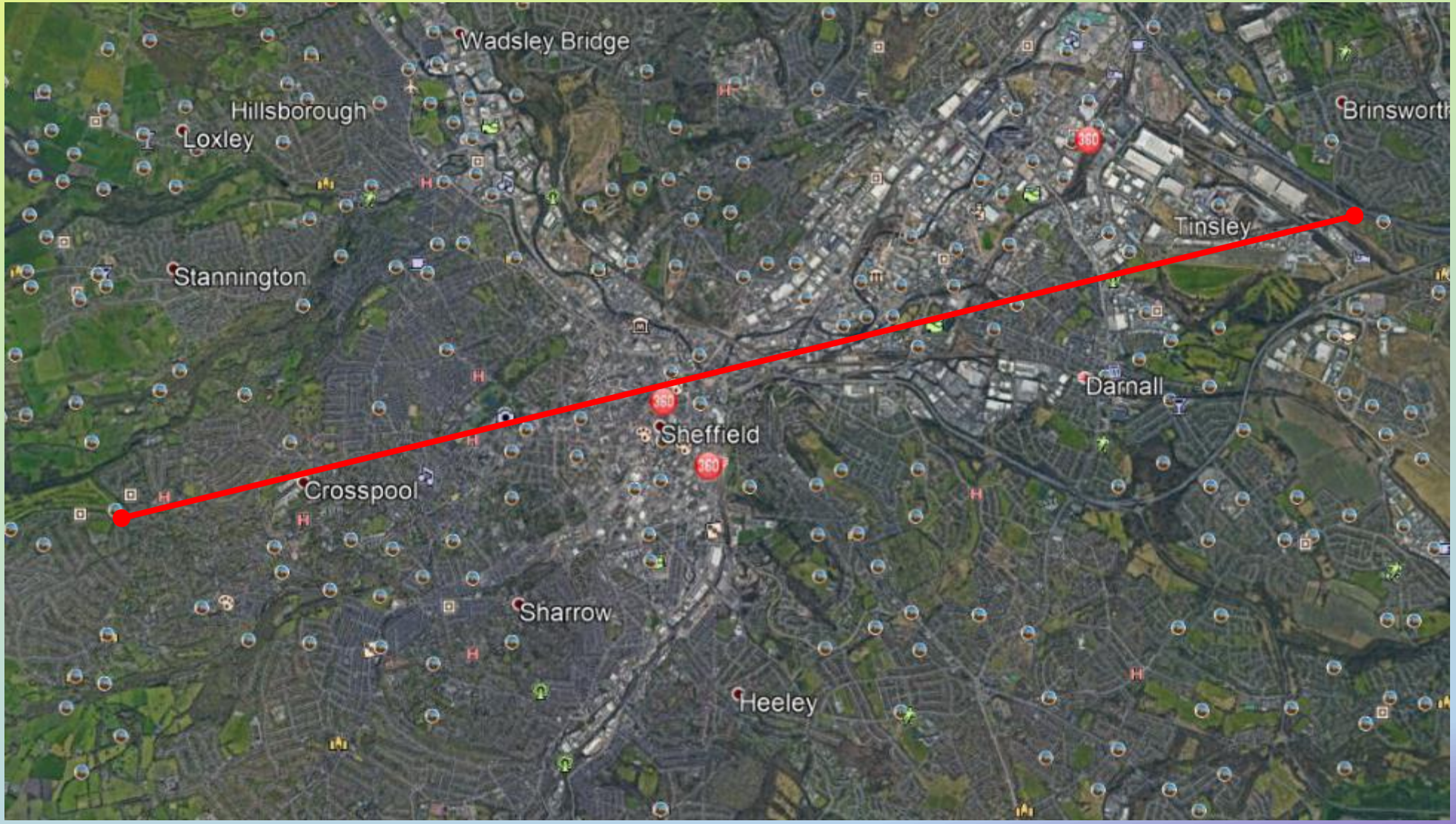
More Biodiversity = Better Human Health

- Natural / green spaces relaxes us & distracts us
- Nature provides uplift (positive effect) – protection against poor mental health
- We breath in natural chemicals / beneficial microbes that regulate our immunity, hormone activity, and determine mental health

Small Green Spaces –

Salford – Significant improvements in Resident's Mental Health

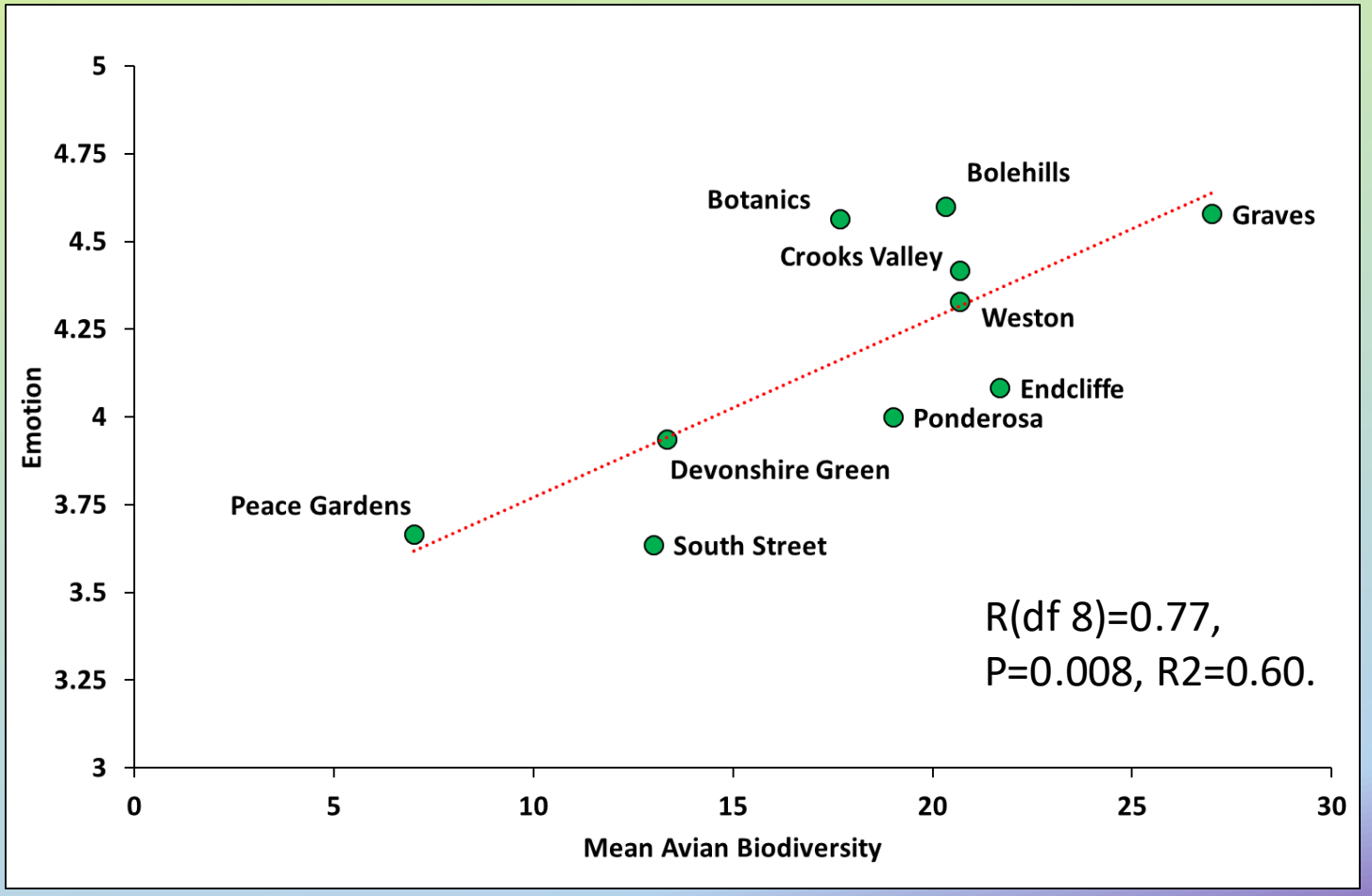
IWUN – Sheffield – Green Space and Mental Health



Phone App
Where are people most happy?

Sheffield Parks - More Biodiversity

= Greater the Positive Emotion (Well-being) (Cameron et al, 2020)



Rich Natural Havens

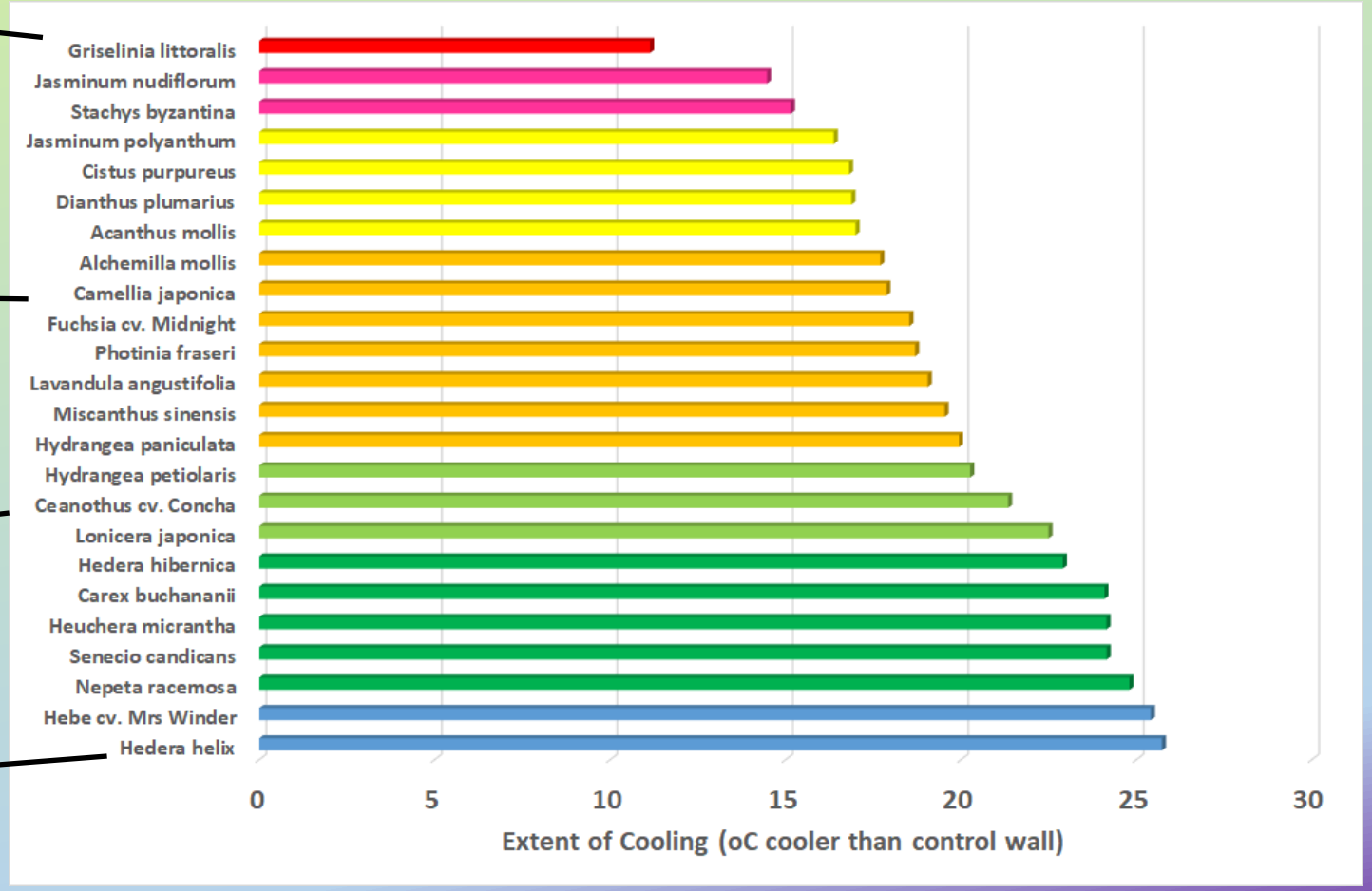
- Protects wildlife
- Keeps us alive!

Other useful Tools
Plants STOP Buildings and Cities from Overheating!

Natural Insulation
Save Energy Bills by 1/3

Building Wall cooling – Effect of plant taxa

(Wall surface temperature = 55°C) – Kunasingam et al., 2024



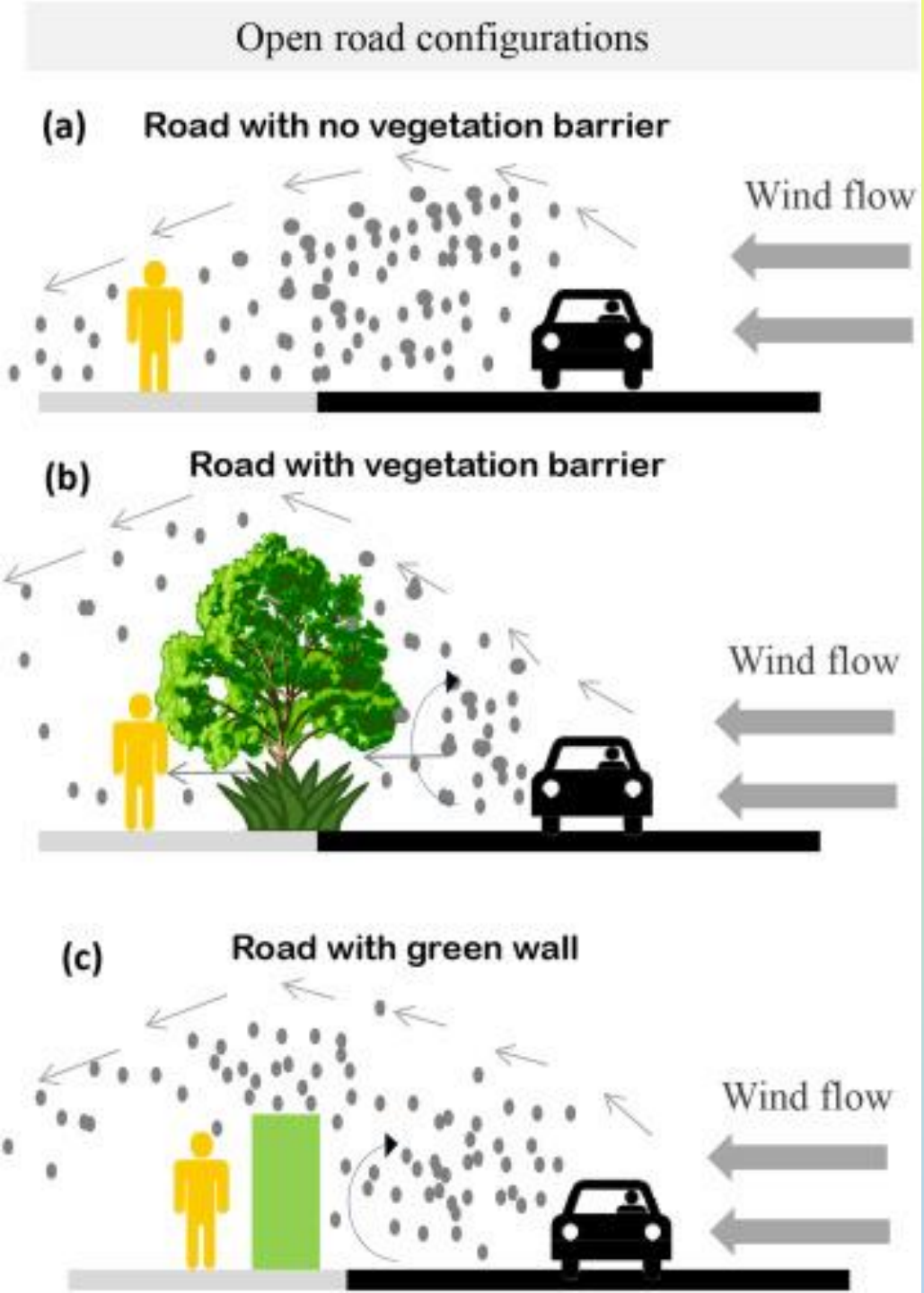

SUDS –
Biologically –rich
plant communities
STOP
Flooding
Green Sponge
&
Green Pump Effects
Nur Ismail et al., 2023

Case Study
Air Quality

School Green Barriers

Primary function – improving air quality in the playground

But lots of 2ndary benefits



Green Barriers – Open Road Situation

(Blanusa et al., 2019)

Worked with

- Schools
- Parents
- Business
- Councils

To implement Green Barriers

Also now working with the National Nature Park

https://nbshub.naturebasedsolutionsinitiative.org/guide/clean-air-in-schools-using-green-barriers-guidance-for-practitioners-and-schools/

Abhijith et al., 2017

Improving Local Air Quality

Relationships between particulate matter size and density on plant leaves of different taxa

Thuja occidentalis

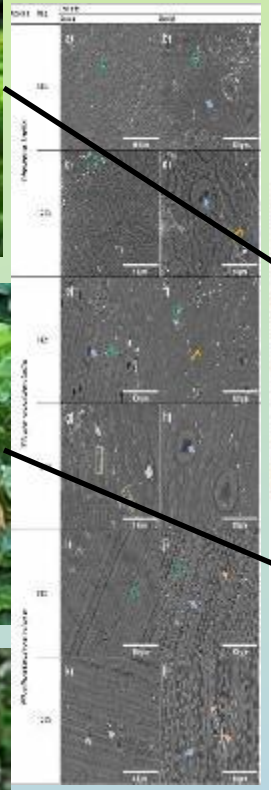
Wikipedia

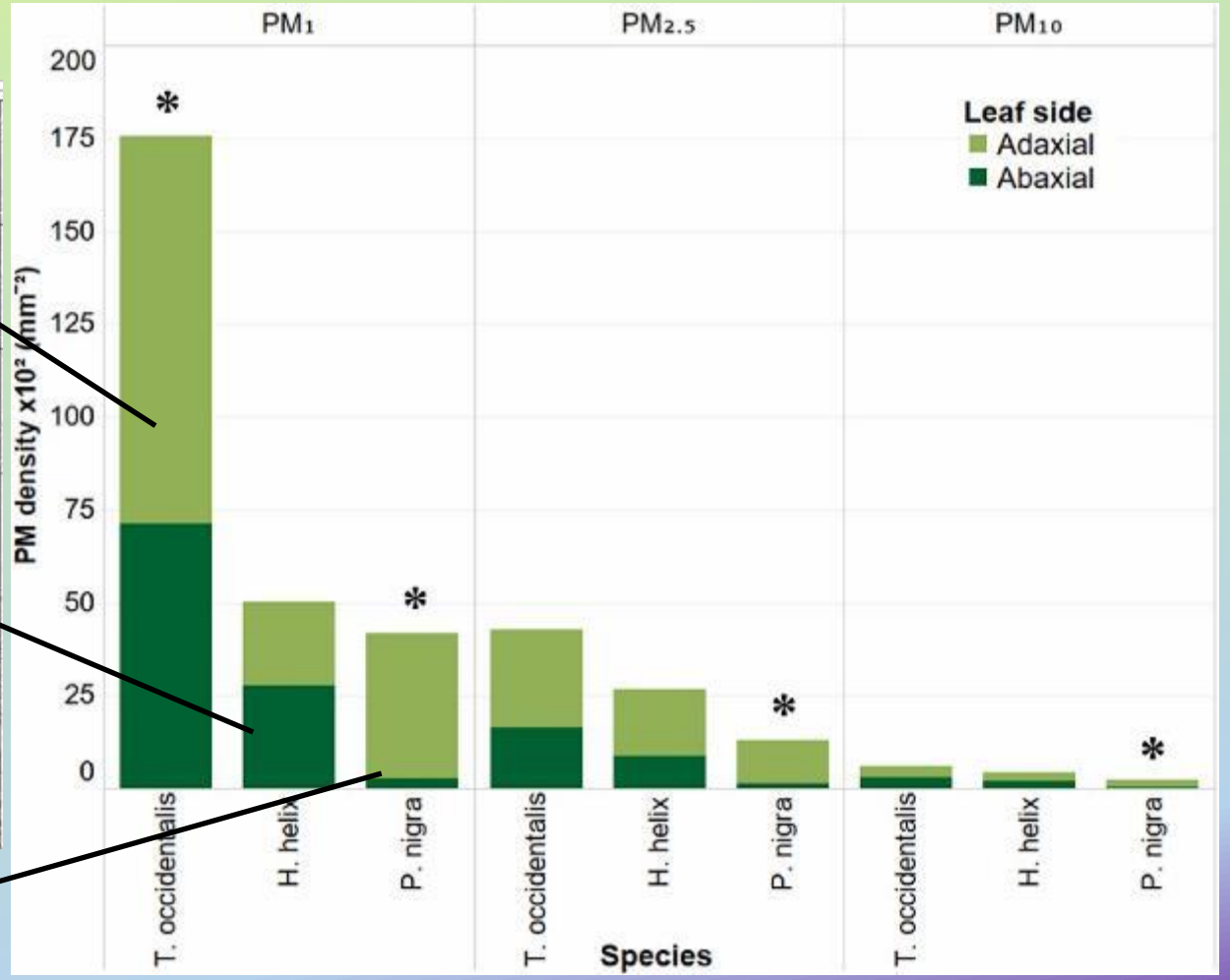
Hedera helix

Flickr

Phyllostachys nigra

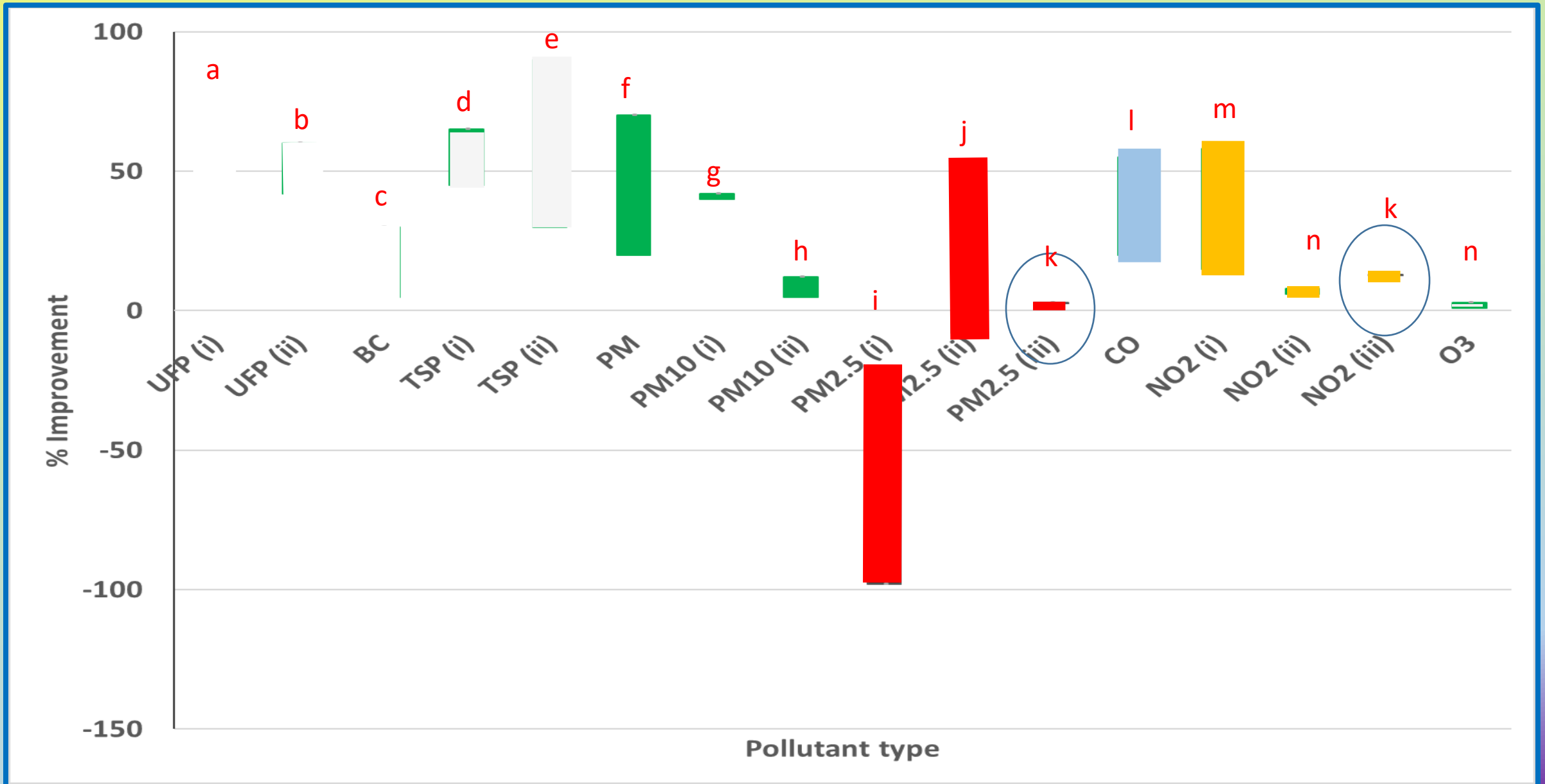
Les Poales

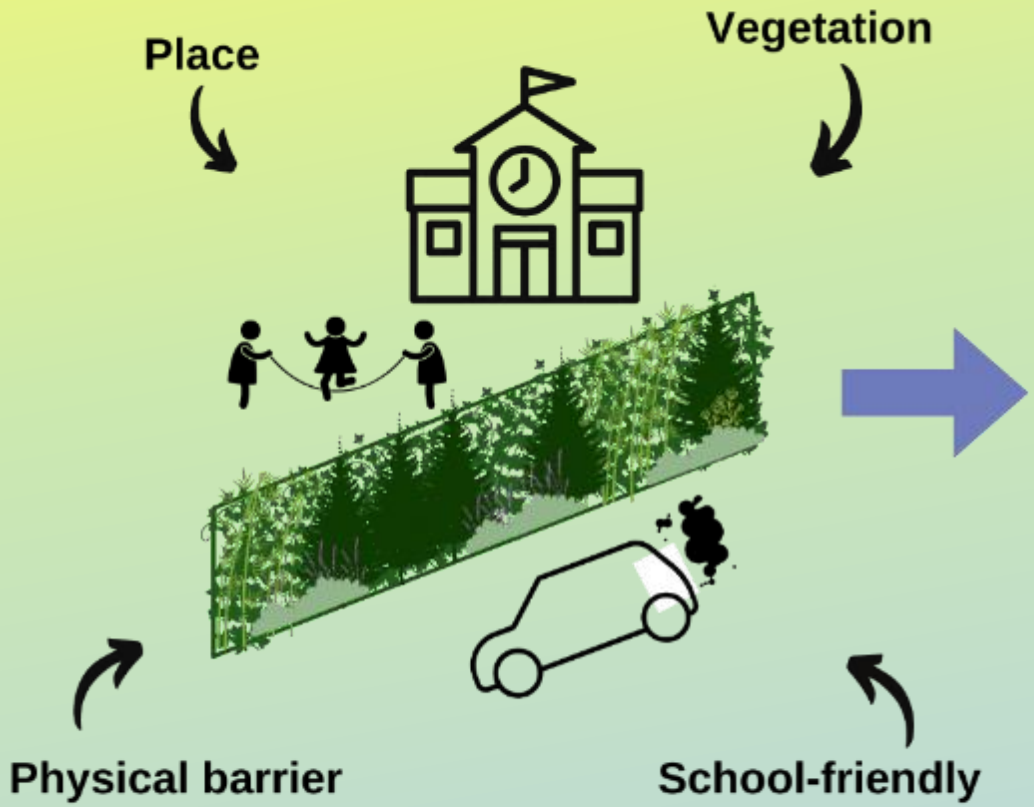




(Bermudez et al., 2021)

Green Barriers –
Change in pollution level compared to no barrier (Abhijith et al., 2017)





Co-benefits

Social

- School premises safety
- Improved place quality
- Relaxing/uplifting environment
- Learning opportunities
- Connection with nature
- Access to greenspace
- Child development and play
- Community's active engagement

Environmental

- Habitat provisioning and connectivity for wildlife
- Sustainable living an environmental awareness

Economic

- School subscription/interest
- Property betterment and visual enhancement
- Positive public perception of businesses involved

Thank You

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TRANSFORMATIONAL URBAN GREENING

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University of Sheffield, UK

Nigel Dunnett

Professor of Planting Design and Urban Horticulture

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INFILTRATING TRANSFORMATIONAL NATURE, EVERYWHERE

INFILTRATING TRANSFORMATIONAL NATURE, EVERYWHERE

Applying our ideas on a large-scale changes places.

It changes how they look

It changes how they are experienced

It changes they are used

It changes *who* uses them

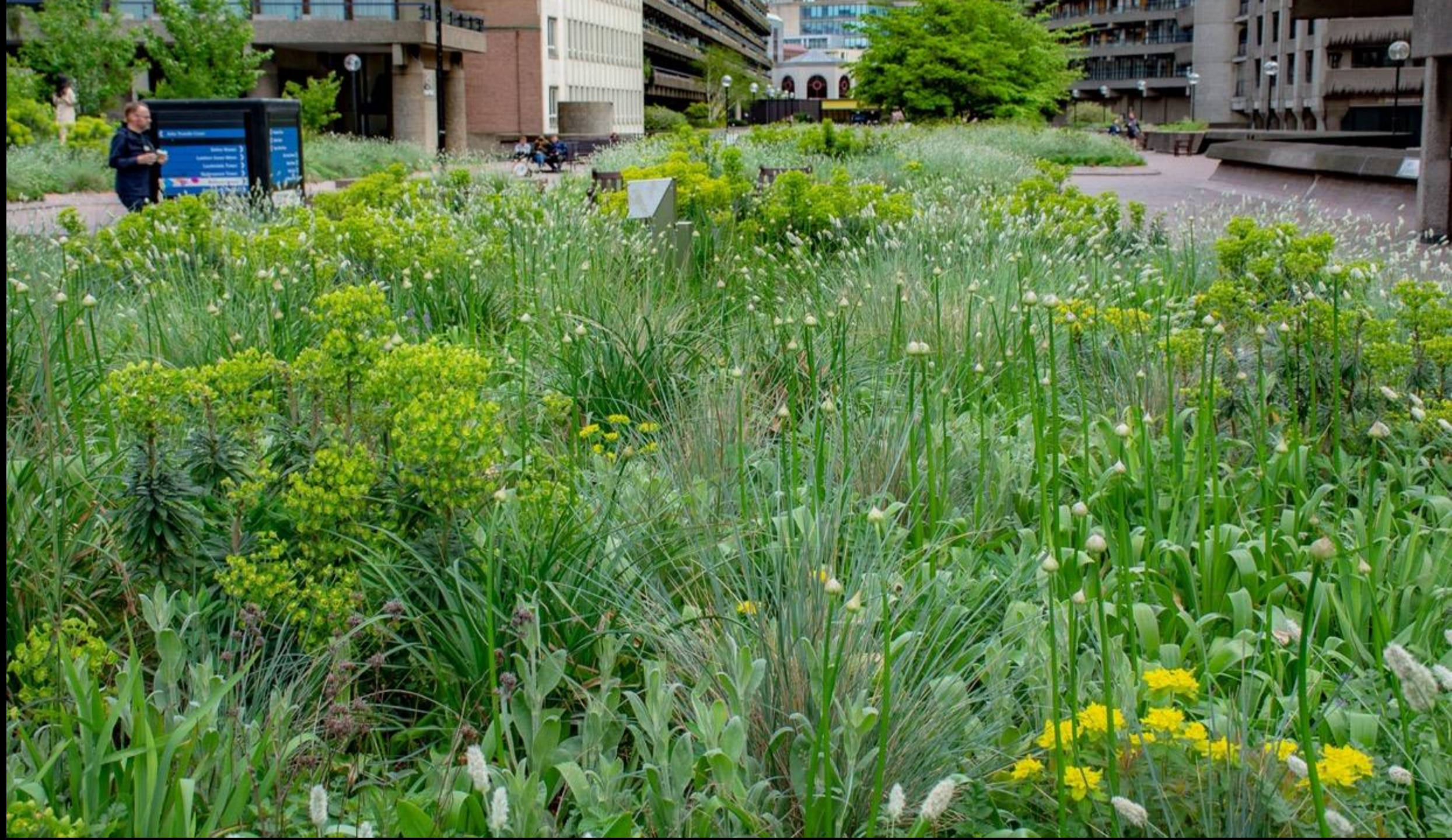
It changes how they are maintained and managed

The Barbican London

Europe’s largest arts and cultural complex: cinemas, theatres, gallery spaces, conference facilities

Residential community: 4000 people live in apartments

Managed by the City of London Corporation (the local authority)




Barbican
Centre

70% reduction in water use
High resident satisfaction
Supports City of London's Biodiversity and Climate-Adaptation policies

Sheffield Grey to Green

Grey to Green Scheme, Sheffield
Planting Design: Nigel Dunnett (University of Sheffield)

Sheffield Grey to Green

Grey to Green Scheme, Sheffield
Planting Design: Nigel Dunnett (University of Sheffield) & Zac Tudor (Sheffield City Council)

Sheffield Grey to Green

Flooding in 2007 affected 1275 domestic properties and 1000 business properties

2 people died

Total cost of damage: £30 million


TO LET
OFFICES TO LET
DID YOU KNOW THAT...
... WE DO BUSINESS STORAGE

‘Grey to Green Scheme, Sheffield, UK

15 kilometres green street

Conversion of multi-lane highway and side walks to 60% diverse planting, footways and cycle ways, with multiple environmental, social and economic benefits

Phase 1 2016

Phase 2 2020

Phase 3 2025

Artistic impression
Image courtesy of Sheffield University


GIVE
WAY
Northern General
Hillsborough
97


SQUARE

Grey to Green Scheme, Sheffield
Planting Design: Nigel Dunnett (University of Sheffield) and Zac Tudor (Sheffield City Council)


irwinmitchell


THE
ALEXANDRA
Restricted parking ZONE
No loading
Except in signed areas
Restricted parking ZONE
No loading


May 2023
THE ALEXANDRA
Restricted parking ZONE
No loading


October 2022
THE ALEXANDRA
Restricted parking ZONE
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Restricted parking ZONE
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TO LET


OPOLITAN

24,000 bath tubs of water prevented from entering the River Don every year

£1 million of inward investment has been attracted

At least 540 jobs created

A BREEAM study undertaken by ecology consultancy ECUS concluded that biodiversity increased by 561% in the area after Phase 2 of the