

Measuring the Benefits of Green Infrastructure and Natural Capital in Urban Areas: The Defra Local Action Project

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London**



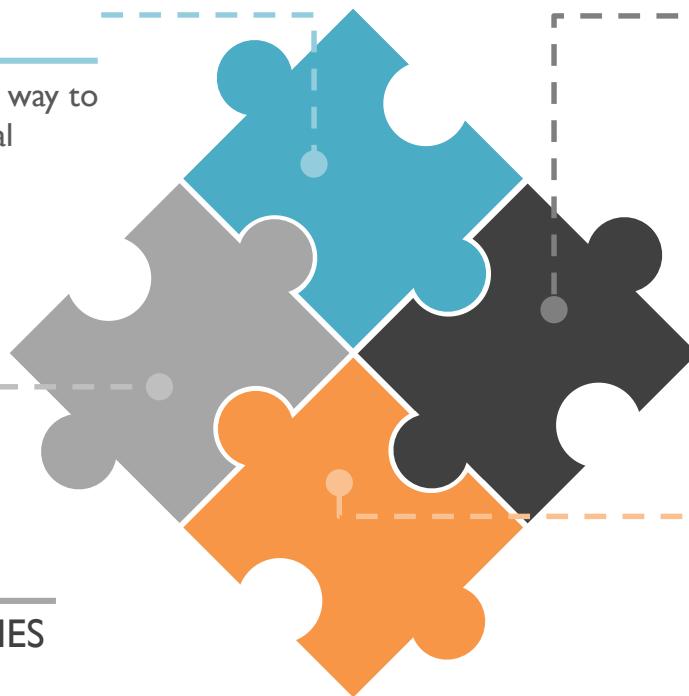
Working with local communities to enhance the value of natural capital in our towns, cities and other urban spaces to improve people's lives, the environment & economic prosperity...

**STRATEGIC DATA, EVIDENCE
+ INFORMATION**

Present robust evidence in a clear way to help build consensus, facilitate local decision-making & secure funding

**VALUING THE BENEFITS FROM
NATURAL CAPITAL**

Develop a clear understanding of the social, cultural, environmental and economic benefits provided by natural capital in urban landscapes and estimating potential improvements



**LOCAL CHOICES, PRIORITIES
+ AMBITIONS**

Talk to the local community and civil society groups to discover their future vision and ambition for where they live

**FUNDING + RESOURCES
FOR ACTION**

Support the formation of effective stakeholder-led partnerships by increasing engagement, mobilising local delivery organisations and tapping into funding sources

LOCAL ACTION PROJECT

PROJECT OUTPUTS

A suite of evidence and information resources to support the targeting and implementation of environmental management/enhancement action in urban landscapes



Review of environmental assets & natural capital value

Comprehensive review of the environmental infrastructure playing a role in the provision of benefits to people living in the urban landscape. The magnitude and diversity of these benefits will be quantified and/or monetised).



Strategic assessment of benefits (need, priority)

Assessment of 12 benefits metrics to support strategic targeting of actions. Combined with statutory or other priorities and drivers, to indicate greatest need (or opportunity) for interventions.



Urban practitioners 'toolbox'

A list (or 'toolbox') of interventions; including feasibility criteria, the 'needs' addressed, and the likely cost and the diversity and magnitude of the benefits likely to be realised.

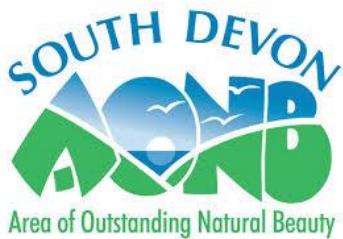


Detailed opportunity mapping

Development of a list (or 'toolbox') of interventions; including feasibility criteria for its delivery, the 'needs' it has the potential to address, the likely cost and the diversity and magnitude of the benefits likely to be realised.



PARTNERS INVOLVED



INDICATORS OF BENEFIT

BENEFITS

Economic
 Cultural Social
 Environmental

Average House Price
 Mean price paid for a terraced house in 2015.

Access to Greenspace
 Percentage of people in a ward who live within 600m (10mins) walk of an accessible greenspace.

Flood Damage Cost (Surface Water)

Estimated costs incurred due to flood damage from SW flooding, based on figures in the EA National Flood Risk Assessment (NaFRA).

Air Quality (PM_{2.5})

Mean concentration of PM2.5 modelled for 2016, derived from background maps from the UK-AIR data archive.

Local Climate Regulation

Urban heat island effect measured using Landsat 8 satellite thermal imaging data.

Flood Risk (Rivers and Sea)

Number of properties that have a greater than 1 in 100 year chance of flooding from rivers and/or sea.

Habitats for wildlife

Percentage of ward area that is described as a priority habitat in Natural England's Priority Habitats Inventory.

Flood Risk (Surface Water)

Number of properties that have a greater than 1 in 100 year chance of flooding from surface water.

Low Flows

The water availability value of river waterbody catchments, according to the EA's Catchment Abstraction Management Strategy (CAMS).

WFD Pressures/RFFs

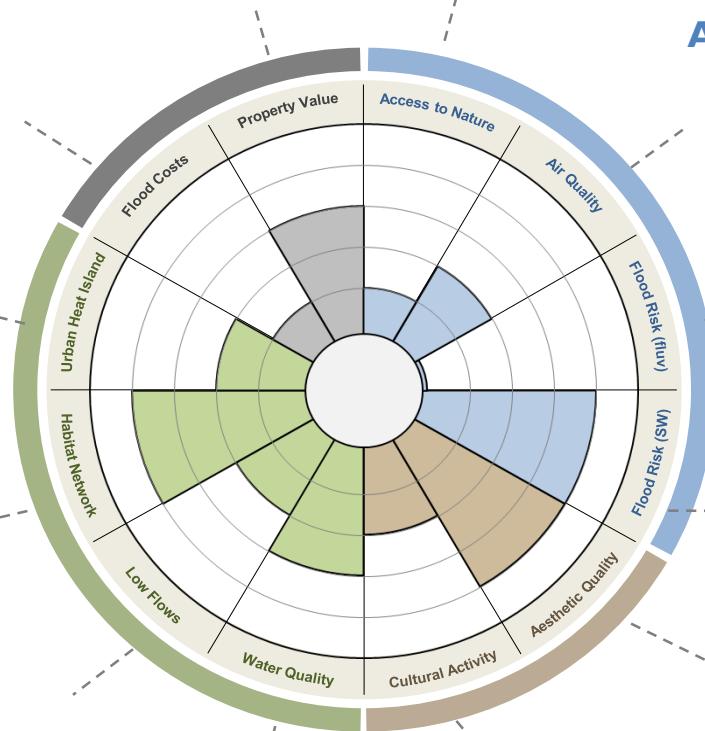
Number of urban 'reasons for not achieving good WFD status' identified for each river waterbody.

Cultural Activity

Number of natural environment-related cultural resources/facilities per 1000 people, including places such as allotments, sports clubs.

Aesthetic value of landscape

Number of nature-related photos taken in the area that have been uploaded to Flickr and tagged accordingly.



LOCAL ACTION PROJECT

MANCHESTER SUMMARY

LOCAL ACTION PROJECT



SUMMARY

URBAN TOOLBOX

Urban Interventions

- Restoration / regeneration of urban environments
- Retrofit or greening actions
- GI or SuDS in new development

Existing Blue & Green Infrastructure

- Increased functionality – e.g. increased amenity or access

Factsheets developed for each intervention

- Benefits
- Landscape context
- Cost
- Maintenance
- Feasibility

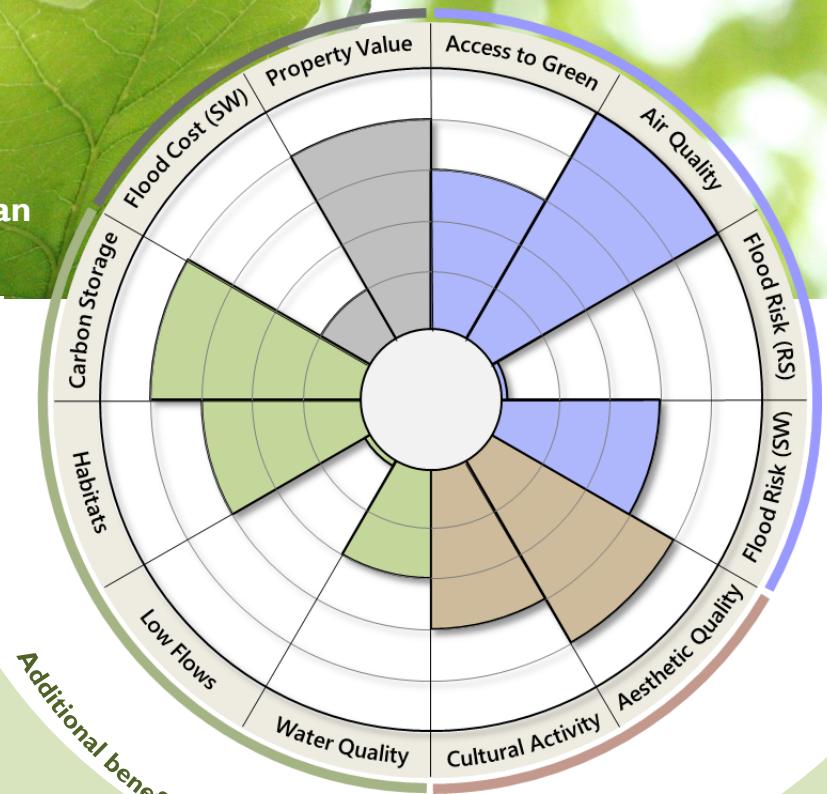


TREES

Street trees, tree pits, urban forest

Trees can perform a number of functions that in turn provide a number of different benefits to people in urban landscapes -

- + Improving air quality by trapping pollutants
- + Intercepting rainfall to slow the rate of water reaching the ground
- + Increasing infiltration by creating permeable surfaces
- + Reducing runoff through root uptake of water and transpiration
- + Trees are also aesthetically pleasing natural features in an urban landscape and thus provide many less tangible benefits that improve people's quality of life, health and wellbeing



IMPLEMENTATION

Trees are very versatile and can be used in a variety of situations. The benefits produced depend on their size, species, location and style of delivery.

 **£ £ £** Costs per singular tree: £100-400 (including planting and initial maintenance)

 **£ £ £** Maintenance: mainly pruning (as part of landscape management)

 Feasibility: can be planted in pavements large enough to receive them. Can be planted on existing GI or in new developments

Additional benefits

HEALTH & QoL

- ↓ stress levels
- ↑ exercise frequency
- ↑ New-born health

ENERGY SAVINGS

- ↑ exercise frequency
- ↑ New-born health

Risks + challenges

- ↑ allergy risk 
- Can block views 
- Property damage: roots, litter, shading 

TREES

Street trees, tree pits, urban forest



Urban Forest Effects Model (UFORE) & i-Tree Eco

The Urban Forest Effects Model (UFORE) is a science-based, peer-reviewed computer model designed to assess and quantify urban forest ecosystem services, based on field data inputs and external datasets (e.g. weather and pollution). It was adapted for inclusion with the i-Tree software suite from the USDA Forest Service, and was subsequently renamed as i-Tree Eco.

www.itreetools.org



Longitudinal effects on mental health of moving to greener and less green urban areas.

Alcock I, White MP, Wheeler BW, Fleming LE, Depledge MH.

Environmental Science & Technology (2014) 21; 48 (2):1247-55.

Moving to greener urban areas was associated with sustained mental health improvements, suggesting that environmental policies to increase urban green space may have sustainable public health benefits.



Torbay's Urban Forest

The study (the first of its kind in the UK) used the i-Tree Eco model (developed by the US Forest Service, and based on peer reviewed research) to quantify the structure, and some of the major environmental benefits delivered by Torbay's trees.

www.torbay.gov.uk/tuf.pdfitreetools.org



Street Tree London

Street Tree is a non-profit making company founded on the belief that trees should form an integral part of the urban landscape. Our aim is to increase London's tree stock, working with Local Authorities, Fund-holders, and business partners, to promote street trees and the many benefits they bring.

www.streettree.org



Red Rose Forest – Green Streets Case Studies

Red Rose Forest's Green Streets team is dedicated to making our towns and cities greener and more attractive places to live, work and invest. They plant street trees, deliver bespoke street greening projects, create places to grow food, greenspace improvement, plant community woodlands and orchards, build green roofs and improve school grounds.

tinyurl.com/j3vhpqm



Wirral Street Trees Programme

A tree planting programme that is helping to transform Wirral into a thriving economic hub. By April this year over 600 trees across 8km will have been planted in streets and green spaces, as part of a three-year programme to link residential areas to places of employment and training.

tinyurl.com/jn5ggpd



Stakeholder
dialogue



Partnership
working



Benefits/value
assessment



Strategic
targeting



Practical delivery
of measures

OPPORTUNITY MAPPING

Perform high resolution hydrological and suitability analyses to identify candidate sites for specific interventions – these sites can then be 'worked-up' with resource/funding sought, community consultation, optioneering, design and delivery.

STREET TREES

Potential for Street Trees:

- Roadside (>2.5m width & 4m from buildings)



HYDROLOGICAL CONNECTIVITY



SuDS opportunity..?

SuDS opportunity..?

SuDS opportunity..?

FEEDBACK ON INITIAL PHASE

“The process has been really thought provoking”

“The work will be critical in our commitment to reaching communities and raising flood awareness in urban Leicester”

“The work has helped us become clearer on what we need to demonstrate to different audiences and how”

“The work has helped progress four local levy bids in the Soar totalling around the million pound mark”

“We have used the work in support of funding bids, and to build business cases”

“The Local Action Project approach has been very well received in and around Manchester. Its outputs will be really helpful and will enable partnerships to build consensus and prioritise”



BOUNTY in Manchester



Welcome to the **Benefits Of Urban Nature To You** toolkit

Natural aspects such as trees and green space can provide many benefits to people who live in urban areas; these include flood protection, improved air quality and places for recreation and cultural activities. However, the benefits provided can vary depending on where you live. This tool allows you to explore the benefits provided in the different areas (Wards) of Manchester and investigate what can be done to increase these. The tool also asks for your input about what you think the priorities are for where you live and what you would like to see happen to improve your experiences of living in Manchester.

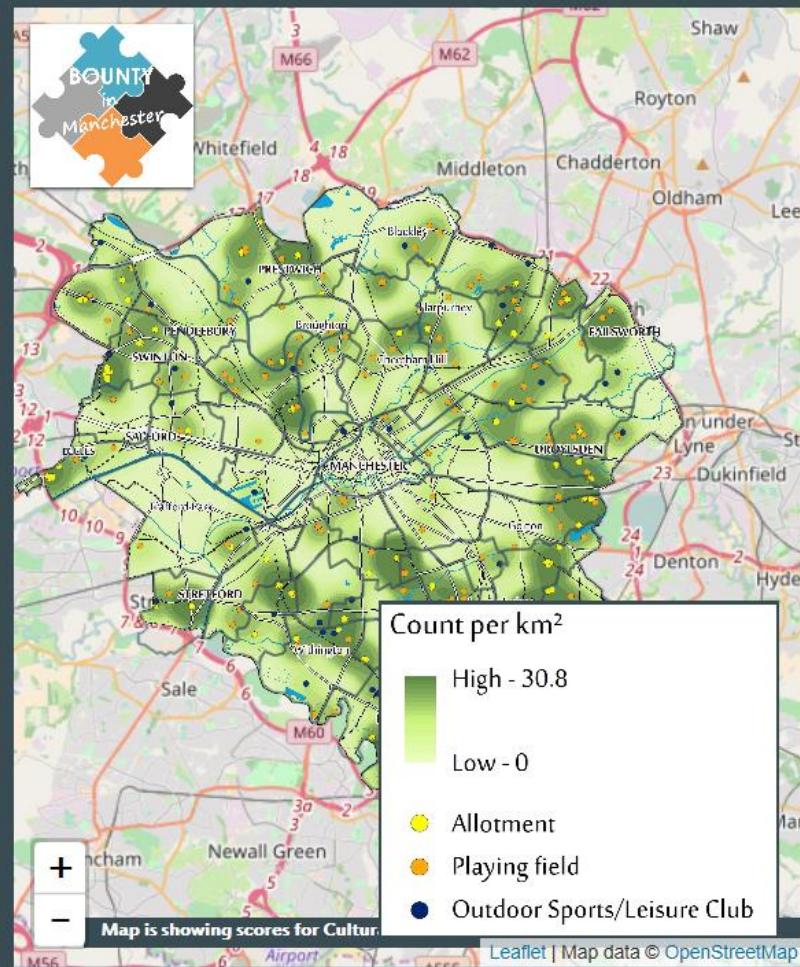
This tool is for everyone who lives in Manchester and is interested in seeing improvements to where they live. Happy exploring...

Let's explore...



Toolkit Get involved

23 February 2017
Thursday



Benefits for Bradford

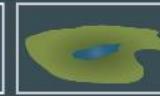
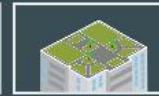
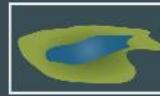
Aesthetic Value of Landscape

1. Score

2. About ?

3. Drivers

4. Actions



<Back

Next>

<Step 2

Wheel

Benefits

Show Map

Reset Map

Step 3: Explore the Benefits [More...]

BOUNTY Get Involved

General Feedback

Benefits Feedback

Interventions Feedback

My Manchester

Final Feedback

...

About yourself

eg Age, education, household size, employment status, gender, ethnicity, ... TBD

Not at all

Completely

Overall, how satisfied are you with your life nowadays?

Overall, to what extent do you feel that the things you do in your life are worthwhile?

Overall, how happy did you feel yesterday?

Overall, how anxious did you feel yesterday?

Why did you participate?

Enter your reason...

Send

+

-

FEEDBACK ON BOUNTY

“This is a powerful tool - brings local focus in the context of a wider strategy - allows prioritisation of actions according to £”

“Excellent tool! Simple to navigate & easy to view

“Great tool for engaging and beginning discussions”

“Whole concept has huge potential for long-term engagement”

“Could be used as a strategic planning tool to identify and prioritise actions over a large area”

“It has huge potential for linking local action and engagement to strategic planning”

“can be used to identify opportunities where the Natural Capital can be enhanced. it can help to build ambition which will be useful for the catchment partnerships, Natural Course and Urban Pioneer”

FINDINGS

- Local Action Project provides a method to measure multiple benefits of Natural Capital in urban areas
- Easily comparable format between local areas
- Identifies priorities and needs at city and ward level
- Method for opportunity and feasibility mapping
- Creates an evidence base to fund projects
- Facilitates participatory planning
- Greater measures of health and well-being needed

An aerial, isometric illustration of a sustainable urban development. A central river flows through the town, with a bridge crossing it. The buildings are modern and multi-story, interspersed with green spaces, parks, and pedestrian paths. A soccer field is visible in the upper right. The overall scene depicts a vibrant, eco-friendly community.

Thank you

<http://urbanwater-eco.services/>

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