



# **ALL OUR TREES**

**GREATER  
MANCHESTER'S  
TREE AND  
WOODLAND  
STRATEGY**



# SUMMARY

Trees and woodlands are part of the fabric of Greater Manchester and provide a huge array of benefits addressing pressing issues like poor air quality, flooding and extreme weather events.

Yet they are under threat – not only from urban expansion but climate change, which represents the most significant danger to the long-term health of global ecosystems as well as our way of life.

However, trees and woodlands could be one of the best solutions to our climate emergency – multifunctional, living tools that help make our urban areas more resilient to the challenges of a rapidly changing environment

Therefore we need a strategy to get the most from our trees – now and in the future.

All Our Trees will collectively guide us to improve the way in which we plant and manage our trees and direct us to where new tree planting will provide the most benefits for generations to come.

We need to plant more trees, and larger, long-lived species, and to ensure trees are managed to get the most from them.

Funding the creation and management of new woodlands is a major challenge. By highlighting the value of our trees and making links between business, landowners, local authorities and citizens, we can work together to deliver a greener city region that is healthier, prosperous and resilient to the challenges we currently face now and in the future.

The information and priorities that follow in this strategy are based on the largest empirical tree data gathering exercise of its kind in the UK, delivered by City of Trees on behalf of the Greater Manchester Forests Partnership.

## ACKNOWLEDGEMENTS

This strategy was produced by City of Trees, on behalf of the Greater Manchester Forests Partnership – a partnership comprising representatives from the 10 Greater Manchester districts, the Forestry Commission, Natural England and the Woodland Trust. The partnership is grateful for generous support from the Greater Manchester Combined Authority, United Utilities, The Forestry Commission, The Woodland Trust, and Viridor.

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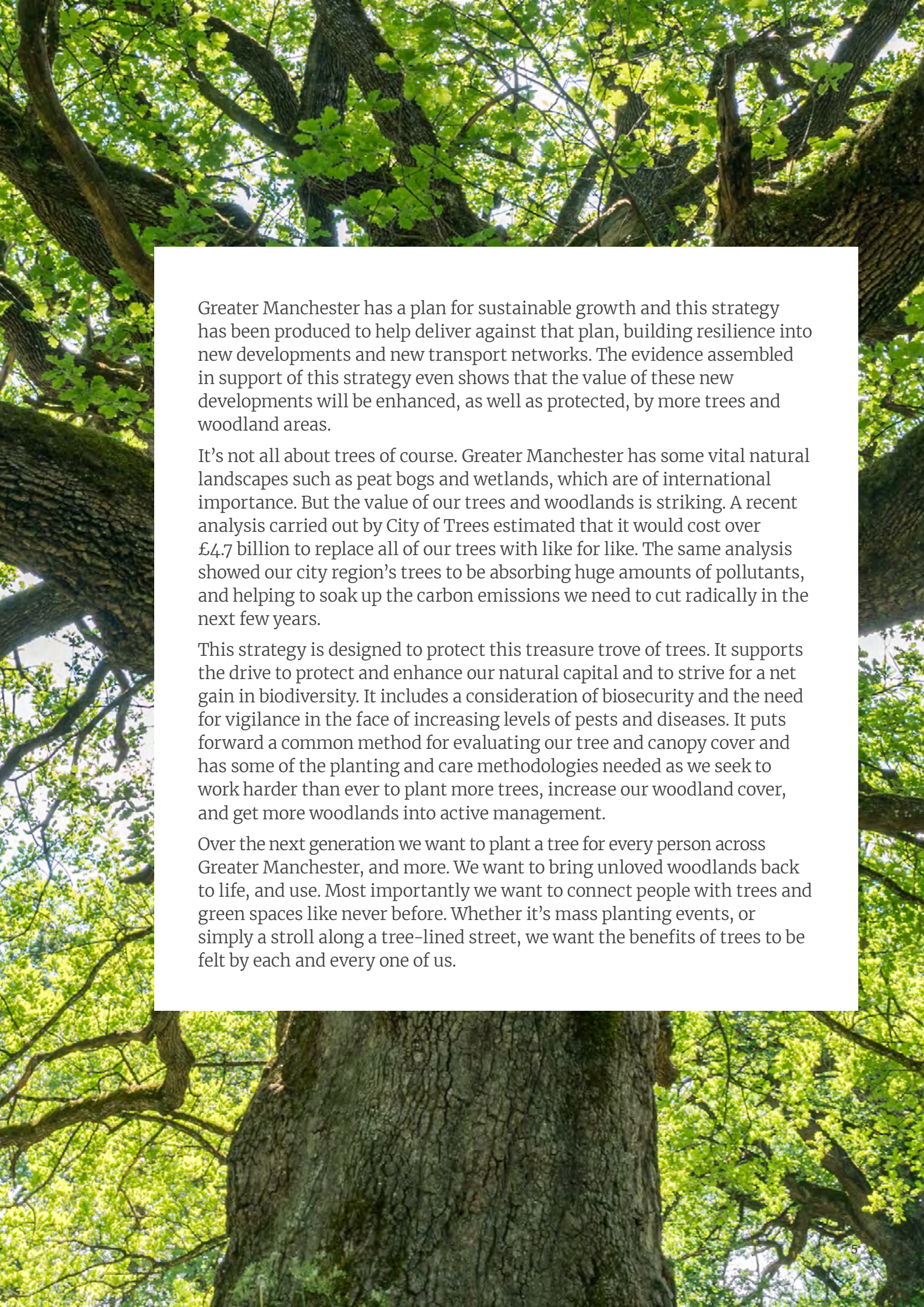
# INTRODUCTION

**For a future-facing, dynamic and vibrant city region like Greater Manchester, nature really matters. When we think of our towns and cities we tend to think of a hard, built environment, but that's not the whole story. It's the green that brings the grey alive, and it's nature that makes these places liveable. Nature brightens our day, it helps us attract talent and it makes our streets and neighbourhoods more resilient.**

Trees and green spaces are a magical part of the recipe for a healthy, beautiful and thriving Greater Manchester. That's why this strategy is so critical and timely. Our standing as a global city, competing for the brightest minds, the biggest ideas, and the boldest future plans depends on creating an environment for success. Our Green Infrastructure, as it's sometimes known, is every bit as important as the other key elements of infrastructure that underpin the growth and sustainability of the city region we call home.

Our natural 'capital', including trees, is more than just a key ingredient of a winning city region: it is indispensable as we face an increasingly turbulent future. We face mounting challenges like poor air quality around schools and homes, the risk of flooding, extreme weather events – all can be countered to a greater or lesser degree by trees and woodlands. Nature-based solutions are a vital response to the climate emergency.





Greater Manchester has a plan for sustainable growth and this strategy has been produced to help deliver against that plan, building resilience into new developments and new transport networks. The evidence assembled in support of this strategy even shows that the value of these new developments will be enhanced, as well as protected, by more trees and woodland areas.

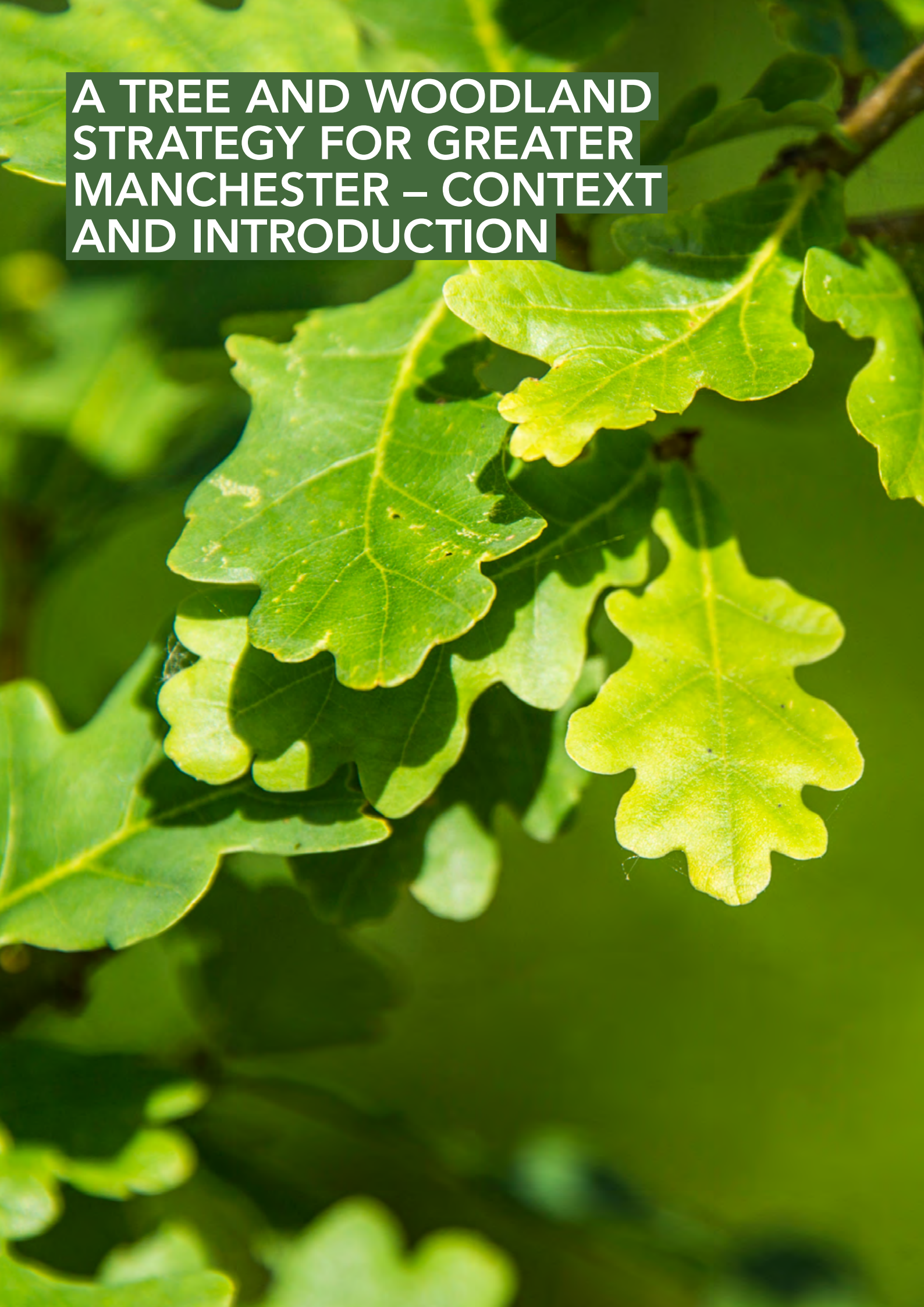
It's not all about trees of course. Greater Manchester has some vital natural landscapes such as peat bogs and wetlands, which are of international importance. But the value of our trees and woodlands is striking. A recent analysis carried out by City of Trees estimated that it would cost over £4.7 billion to replace all of our trees with like for like. The same analysis showed our city region's trees to be absorbing huge amounts of pollutants, and helping to soak up the carbon emissions we need to cut radically in the next few years.

This strategy is designed to protect this treasure trove of trees. It supports the drive to protect and enhance our natural capital and to strive for a net gain in biodiversity. It includes a consideration of biosecurity and the need for vigilance in the face of increasing levels of pests and diseases. It puts forward a common method for evaluating our tree and canopy cover and has some of the planting and care methodologies needed as we seek to work harder than ever to plant more trees, increase our woodland cover, and get more woodlands into active management.

Over the next generation we want to plant a tree for every person across Greater Manchester, and more. We want to bring unloved woodlands back to life, and use. Most importantly we want to connect people with trees and green spaces like never before. Whether it's mass planting events, or simply a stroll along a tree-lined street, we want the benefits of trees to be felt by each and every one of us.



# A TREE AND WOODLAND STRATEGY FOR GREATER MANCHESTER – CONTEXT AND INTRODUCTION





## 0.1 WHO HAS PRODUCED THIS STRATEGY?

This tree and woodland strategy, the evidence base, modelled priorities for new planting, and the guidance and standards were developed and written for the Greater Manchester Combined Authority (GMCA) by City of Trees on behalf of, and with contributions from the Greater Manchester Forests Partnership; a partnership comprising officers and elected member representatives from each of the 10 Greater Manchester districts, the Forestry Commission, Natural England, and the Woodland Trust.

## 0.2 THE FOCUS OF THIS DOCUMENT

This strategy is presented in five sections:

**A tree and woodland strategy for Greater Manchester – context and introduction:** Provides a summary of key evidence and current research, setting out the critical importance of trees to the economy and people of Greater Manchester, and makes the case for why we need to work urgently to protect and expand our urban trees.

1. **Section 1 – Protecting and increasing the benefits from our trees – the strategy:** Sets out Greater Manchester's priorities and the collective actions required, as informed by the evidence base.
2. **Section 2 – Greater Manchester's trees – the evidence base:** Presents results of largest tree survey of its kind in UK and provides detailed analysis of Manchester's urban forest in terms of its distribution, structure, what shape it is in, and the benefits to Greater Manchester's economy and residents.
3. **Section 3 – Where do we need more trees?** Presented as a series of maps (also hosted online at [Mapping GM<sup>1</sup>](https://mappinggm.org.uk/gmodin/?lyrs=v_cot_tree_planting_opportunity/os_maps_light/11/53.5069/-2.3201)), this section uses data to model those areas where tree planting could help meet a range of individual ecosystem service needs, and at which locations planting could meet multiple needs.
4. **Section 4 – Guidance and standards – getting more from our trees:** Provides detailed standards, best practice, and legal requirements that describe all aspects of how we should plant, establish, and manage our trees to ensure health and longevity, maximise ecosystem benefits and resilience, and minimise the potential disbenefits of trees.

Taken together, this information provides the basis for the protection and expansion of Greater Manchester's forest canopy, assisting our planning process, and setting out defined actions that need to be taken, based on clear evidence about our current tree resource. It also describes where new tree planting should be targeted, and how to make sure new and existing trees and woodlands continue to provide us with key benefits.

The strategy has been written to provide an overarching framework of strategic objectives and principles that Greater Manchester's 10 districts can reflect in their own local plans and tree policies according to local conditions and priorities. This strategy and its key principles are also commended to all organisations across Greater Manchester who own or manage land, deal with trees and/or the environment, or are concerned with the resilience and health of the city region and its citizens.

1 [https://mappinggm.org.uk/gmodin/?lyrs=v\\_cot\\_tree\\_planting\\_opportunity/os\\_maps\\_light/11/53.5069/-2.3201](https://mappinggm.org.uk/gmodin/?lyrs=v_cot_tree_planting_opportunity/os_maps_light/11/53.5069/-2.3201)



### 0.3 IMPORTANCE OF GREATER MANCHESTER'S TREES

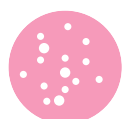
Air pollution, loss and degradation of our environment and habitat for wildlife, flood risk, and anticipated temperature rise, all pose significant threats to a prosperous, healthy city region. We are beginning to experience impacts from a rapidly changing and increasingly extreme climate. These impacts are projected to increase over time. But trees can make a key contribution to addressing these issues.

Trees, planted and maintained appropriately, deliver a range of benefits or ecosystem services:

- Storing carbon, and sequestering more each year
- Enhancing biodiversity
- Providing access to nature
- Reducing risk of flooding and water pollution
- Reducing air pollution
- Providing shade and cooling to combat high temperatures
- Reducing noise pollution
- Stabilising land and reducing soil erosion
- Strengthening landscape character

Having green, tree-filled local environments can make a huge contribution to quality of life, promote good mental and physical health, and create liveable places; benefits that translate into health costs saved and working days gained. Trees can, therefore, improve our resilience to climate change and support economic growth, and should be considered part of Greater Manchester's critical infrastructure.

During 2018, City of Trees undertook possibly the largest physical survey of trees in the UK to better understand the extent, make up, function, and value of Greater Manchester's whole urban forest. The full results of that survey are in [Section 2](#). However, some of the highlights are presented here:



Greater Manchester's trees act as a filtration system for harmful air pollutants – removing 847 tonnes of pollutants each year. This is equivalent to the combined annual emissions from around 2,000 cars each year.



Trees can help prevent surface water and sewer flooding, intercepting 1.6 million cubic metres of storm water runoff per year – this is equivalent to 35,000 road tankers.



Greater Manchester's trees sequester 56,530 tonnes of carbon each year, that's roughly the total amount emitted by 5,000 UK homes each year.



They produce 122,450 tonnes of oxygen each year, enough to sustain around [160,000 people](#)<sup>2</sup>.



The total benefit to Greater Manchester's economy of air pollution filtration, storm water attenuation, and carbon sequestration from our trees is £33,298,891 each year.



It would cost over £4.7 billion to replace all Greater Manchester's trees like for like.

2 <https://www.sciencefocus.com/planet-earth/how-many-trees-does-it-take-to-produce-oxygen-for-one-person/>



Provision of these benefits or services is strongly linked to tree age and these benefits tend to be greater with increased tree stature and leaf area, as well as condition. In order to continue to benefit from our trees, therefore, we need to protect and manage them, particularly our large, mature trees, and ensure they remain healthy into old age. To ensure those benefits are available for future generations, we need to plant many more trees, taking care that we have the right mix of species and varieties that are resilient to change, and properly suited to their location.

In both urban and rural settings, trees shape how we view and connect with places, and we are instinctively drawn to wooded landscapes and cool, leafy streets that have been improved by careful tree planting. Particularly old or large trees are apportioned exceptional historical, cultural, or aesthetic value by the communities who live among them. Trees mean something to people, and we form connections with the trees in their environment. Urban forests are essential for creating vibrant cities and ensuring the health and wellbeing of their citizens.

Further details about the importance of our forest canopy can be found in [Section 2 – Greater Manchester’s trees – the evidence base](#).

## 0.4 WHY DO WE NEED A STRATEGY?

### A CLIMATE EMERGENCY

In May 2019, MPs passed a motion making the UK parliament the first in the world to declare an “environment and climate emergency” followed by Greater Manchester’s elected members echoing this declaration locally. And in June 2019, the UK Parliament amended the Climate Change Act (2008) to include a commitment to net zero emissions by 2050.

Trees, woodlands and forests play a key role in greenhouse gas removal. The [Committee on Climate Change](#)<sup>3</sup> (CCC) has recommended that, nationally, we should be aiming to plant around 30,000 hectares of new woodland in the UK every year. That is nearly a million hectares over the next 30 years. Doing so could absorb approximately 10% of residual GHG emissions alongside the substantial reductions to emissions across the whole economy required to meet net zero targets.

Sustainably managed woodlands perform a vital role as carbon sinks and reservoirs capture carbon dioxide (CO<sub>2</sub>) from the atmosphere and store it as a component of wood itself. Over time, the soil beneath them is enriched by adding carbon in the form of organic matter from leaf litter, branch fall, and root death. In the long term, there comes a time when carbon gained through growth may be balanced by carbon lost to the atmosphere through decomposition. Bringing existing woodland into management could make it more resilient to the impacts of climate change, unlock the potential for it to become financially self-supporting and provide economic benefits like local employment opportunities or community engagement.

Placing woodland creation at the heart of any response to climate change will result in very efficient carbon capture. Achieving afforestation at the scale recommended by the CCC will require land use change right up and down the country. Collaboration will be key to making the challenging choices involved and the devolution of decision-making powers to the Greater Manchester city region, with the establishment of the Greater Manchester Combined Authority and the role of Metropolitan Mayor provides a unique opportunity for the Greater Manchester districts to work together to influence key government initiatives such as the Northern Forest, and to help shape future policy.

<sup>3</sup> <https://www.theccc.org.uk/wp-content/uploads/2018/11/Land-use-Reducing-emissions-and-preparing-for-climate-change-CCC-2018.pdf>



As the GMCA develops its own natural capital approaches to funding improvements to the natural environment, with the development of its Natural Capital Investment Plan, and the introduction of a new Greater Manchester Environment Fund, investment decisions will increasingly be based on natural capital approaches. It is vitally important, therefore, that Greater Manchester has a plan that articulates the benefits of trees and woodlands in terms of natural capital.

## TREES FACE URGENT CHALLENGES

Greater Manchester's trees, as trees across the UK, face several immediate challenges, which require immediate action to address (these are presented in more detail in [Section 2 – Greater Manchester's trees – the evidence base](#)):

**Pests and diseases**, such as ash dieback or bleeding canker (horse chestnut), with around one million of our trees at risk<sup>4</sup> of being lost over the lifetime of this strategy to these diseases.

**Old age or poor health.** The Greater Manchester i-Tree survey results tell us that around 30% of Greater Manchester's trees are in poor or moderate condition, either because of disease, damage or old age. Trees in poor condition are unlikely to thrive and so we can expect that we will lose these trees over the lifetime of this strategy.

**Development** of our urban landscapes, or new development on green field sites also presents a major threat to our forest canopy.

**Mistreatment and loss of urban trees** – either through careless construction or resulting from people coming into conflict with some of the disbenefits of trees, such as unwanted shade. An increasingly important reason for tree loss is unnecessary removals on grounds of safety. It is partly down to risk averse arborists and unclear guidance.

**Climate change** is bringing extremes of temperature, wind, and rainfall, which could have major impacts on our trees. Climate change also allows pests and diseases to expand their natural ranges, putting more trees at risk.



<sup>4</sup> Based on i-Tree results on numbers of ash and horse chestnut across Greater Manchester. Expected losses are not certain but anticipated to be very high for these species.



## WHAT WILL THE STRATEGY DO?

**A collective strategy for the 10 Greater Manchester districts, underpinned by a set of shared principles will present opportunities for more collaborative working, where appropriate, to achieve efficiencies and subsequently greater impact by working at scale, particularly when developing approaches to funding.** A Greater Manchester scale will provide further support for local initiatives whilst providing an overview and strategic set of objectives that can be translated, as appropriate, into the local plans and strategies of each district authority.

This strategy will result in shared knowledge of the vulnerability of our trees, as well as understanding the current makeup of our forest canopy and locations where the need for additional trees is greatest across Greater Manchester and the district scale. It will also help in the development of joined-up plans for dealing with and mitigating the threat, and what we ought to focus on in new and replacement planting to improve future resilience.

The time to plant trees is now. Trees take time to grow, and the benefits we get from them will not be realised until they mature, which could be 20 years or more into the future. Embedding this understanding across Greater Manchester's districts will be vital if we are to ensure that mature trees are protected and that we begin planting the next generation of trees now.

Most of the land in Greater Manchester is in private ownership, outside the control of the districts. A coordinated approach is needed to identify suitable land for new tree planting and maximising the value of emerging funding to incentivise change of land use.

Those responsible for managing public land may be reluctant to increase numbers of trees because of concerns over maintenance liabilities. Engaging and educating our citizens and businesses in the planting of and caring for our urban forest would have multiple benefits and we should encourage involvement in established volunteering programmes.

Trees that are planted well in the first place and maintained properly are less likely to present problems later. Ensuring that all our trees are planted and maintained according to well-established standards should be a priority for Greater Manchester.

### 0.5 VISION FOR GREATER MANCHESTER

Greater Manchester's Five-Year Environment Plan<sup>5</sup> describes a Greater Manchester that is a clean, carbon neutral, climate resilient city region with a thriving natural environment and circular, zero-waste economy where all citizens will have access to green space in every community and more trees in urban areas.

Greater Manchester's aim is to connect people with the environment, creating natural, liveable places, where physical and mental health benefits can be derived and children can be connected to nature, both in and out of school. And in particular the focus should be on disadvantaged areas, which all too frequently experience the lowest and poorest levels of Green Infrastructure provision.

As Greater Manchester's built infrastructure grows, we need our forest to grow with it, to ensure that our towns and cities, as well as our more rural areas, are resilient and continue to be places that people want to live in, work, and visit.

Building on the work of community forestry over the last 20 years or so, the Northern Forest is a 25-year vision to plant 50 million trees across the North of England, stretching from Liverpool to Hull. Delivering this vision will provide major environmental, social and economic benefits that will support implementation of the GMSF<sup>6</sup>.

<sup>5</sup> <https://www.greatermanchester-ca.gov.uk/what-we-do/environment/>

<sup>6</sup> <https://www.greatermanchester-ca.gov.uk/what-we-do/housing/greater-manchester-spatial-framework>



### REGIONAL AND LOCAL POLICY AND STRATEGIES

Greater Manchester [Spatial Framework](#)<sup>7</sup> (GMSF) – All Our Trees provides supplementary, detailed information to the policies contained in The GMSF, which recognises that trees and woodland are vital elements of the Green Infrastructure network, fulfilling the wide range of functions as described above, but also highlights their major role within the urban environment, softening otherwise harsh environments, affording shelter from wind, providing contrast to the scale of tall buildings and creating pleasant public spaces at street level.

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[Individual District Local Plans](#)<sup>8</sup>

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[Greater Manchester Strategy – Our People, Our Place](#)<sup>9</sup>

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[Resilient Greater Manchester](#)<sup>10</sup>

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[Greater Manchester Infrastructure Framework 2040](#)<sup>11</sup>

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[Local Industrial Strategy](#)<sup>12</sup>

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[Local Green Infrastructure Plans and Strategies](#)

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[Flood Risk and Water Management Strategies](#)

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[Pennine Edge Forest Plan](#)<sup>13</sup>

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[Five-Year Environment Plan – natural capital approach](#)<sup>14</sup>

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[Greater Manchester Transport Strategy](#)<sup>15</sup>

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[Clean Air Strategy](#)<sup>16</sup>

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[Natural Capital Investment Plan](#)

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7 [www.greatermanchester-ca.gov.uk/what-we-do/housing/greater-manchester-spatial-framework/](http://www.greatermanchester-ca.gov.uk/what-we-do/housing/greater-manchester-spatial-framework/)

8 [www.secure.manchester.gov.uk/info/200074/planning/6572/local\\_plan](http://www.secure.manchester.gov.uk/info/200074/planning/6572/local_plan)

9 [www.greatermanchester-ca.gov.uk/ourpeopleourplace](http://www.greatermanchester-ca.gov.uk/ourpeopleourplace)

10 [www.gmemergencyplanning.org.uk/](http://www.gmemergencyplanning.org.uk/)

11 [www.greatermanchester-ca.gov.uk/media/1715/greater-manchester-infrastructure-framework-2040.pdf](http://www.greatermanchester-ca.gov.uk/media/1715/greater-manchester-infrastructure-framework-2040.pdf)

12 [www.gov.uk/government/publications/greater-manchester-local-industrial-strategy](http://www.gov.uk/government/publications/greater-manchester-local-industrial-strategy)

13 [www.pennineedgeforest.org.uk/](http://www.pennineedgeforest.org.uk/)

14 [www.greatermanchester-ca.gov.uk/media/1986/5-year-plan-branded\\_3.pdf](http://www.greatermanchester-ca.gov.uk/media/1986/5-year-plan-branded_3.pdf)

15 [www.tfgm.com/2040](http://www.tfgm.com/2040)

16 [www.cleanairgm.com](http://www.cleanairgm.com)



## NATIONAL POLICY

The Climate Change Act 2008 (2050 Target Amendment) Order 2019 – amends the 2008 Climate Change Act to commit the UK to a net zero emissions target by 2050.

Environment Bill 2020 – enhances legal protections for existing trees and woodlands.

Defra's 25 Year Environment Plan – recognises importance of ecosystem services derived from trees, sets out ambition to protect and plant more trees, and highlights the natural capital approach as a tool to help make key choices and long-term decisions about the environment.

National Planning Policy Framework (NPPF)<sup>17</sup> – to be read in conjunction with the 25 Year Environment Plan. The NPPF recognises the importance of trees and requires that planning authorities have plans in place to enhance the natural and local environment.

## DOCUMENTATION

Linked documents are provided below which offer a good background into the policy and context of natural capital.

UK Natural Capital: Ecosystem Accounts for Urban Areas

<https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/uknaturalcapital/ecosystemaccountsforurbanareas>

Natural Capital Committee – Advice to the Government on the 25 Year Environment Plan

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/677872/ncc-advice-on-25-year-environment-plan-180131.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/677872/ncc-advice-on-25-year-environment-plan-180131.pdf)

Natural Capital Committee – How to do it: A natural capital workbook

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/608852/ncc-natural-capital-workbook.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/608852/ncc-natural-capital-workbook.pdf)

*Natural Capital Indicators: for defining and measuring change in natural capital*  
– Jane Lusardi, Patricia Rice, Ruth Waters and Jenny Craven, Published 26th September 2018

<sup>17</sup> [www.gov.uk/government/publications/national-planning-policy-framework--2](http://www.gov.uk/government/publications/national-planning-policy-framework--2)





# SECTION 1 – PROTECTING AND INCREASING THE BENEFITS FROM OUR TREES – THE STRATEGY



## 1.1 AIMS AND OBJECTIVES

### MORE TREES IN THE RIGHT PLACE

To plant at least 3 million trees within 25 years – of which 1 million trees to be planted by 2024, and a further 2 million by 2050 – to help Greater Manchester meet its CO<sub>2</sub> reduction commitments.

We will direct our tree planting strategically – using the opportunity mapping presented with this strategy to guide planting to where there is the greatest need for the benefits from trees.

New trees planted to higher standard, with establishment support to reduce failure and potential conflict with existing infrastructure.

More plantable land identified and released for planting.

More native trees and bigger species in green spaces – more native broadleaved woodlands to support biodiversity.

National urban tree canopy of 16% exceeded.

### EXISTING TREES AND WOODLANDS MANAGED AND PROTECTED

Protection and management of our trees encouraged to deliver more benefits for longer.

Fewer trees removed by developers, and replacements based on appropriate valuation of benefits lost.

Better use made of existing mechanisms to protect valuable mature trees and woodlands.

Restoration and expansion of heritage and new orchards and hedgerows across Greater Manchester.

### ENGAGE OUR CITIZENS WITH THE NATURAL ENVIRONMENT

At least 2,000 hectares of woodland are brought into active management within the next 25 years.

More opportunities created for citizens in the planting and caring for our trees and woodlands.

Better understanding among our citizens and policy makers of the benefits of our trees and woodlands.



## 1.2 PRINCIPLES

These fundamental principles underpin Greater Manchester's approach to protecting and extending our urban forest.

### VALUING OUR TREES/BOOSTING THE BENEFITS

Greater Manchester recognises the multiple benefits of trees.

Recognise the importance of locking up atmospheric CO<sub>2</sub> in trees and help Greater Manchester meet its CO<sub>2</sub> reduction obligations by planting more trees.

We recognise that trees can make our cities more resilient to inevitable climate change.

We view trees and woodlands as part of Greater Manchester's critical infrastructure.

Trees have a valuable role to play in place-making.

Trees and woodlands should be loved and valued.

A joined-up approach to educating people about tree benefits and dealing with conflict could help prevent unnecessary tree loss or damage.

We will lose benefit if action is not taken now to protect and expand our forest canopy.

### PROTECTING AND PRESERVING OUR TREES

We will strive to protect and manage our trees, to allow them to become big and old so that they provide us with the most benefits.

Trees should not be removed unless necessary.

If trees must be removed, they should be replaced based not solely on numbers, but on the benefits lost.

We will adopt a natural capital approach to valuing our trees and woodlands to ensure they are viewed as assets not liabilities.

Community stewardship is a key approach to protecting Greater Manchester's urban trees.

A coordinated approach across local authority boundaries will facilitate protection of our trees from disease and from development.

A coordinated approach between local authorities and third sector organisations is needed to unlock funding.

## GROWING OUR TREES/FUTURE FORESTS

New trees should be planted where they are needed most (see [Section 3](#)).

We should work together to plant more trees in Greater Manchester's towns, cities, neighbourhoods and transport routes.

Landowners should be encouraged to release land for planting, where this doesn't conflict with other priority habitat.

Landowners should be encouraged to bring existing woodlands back into management and to promote good management practice.

Quality is better than quantity – planting fewer trees to a higher standard will achieve more benefits than high volume, low-quality planting.

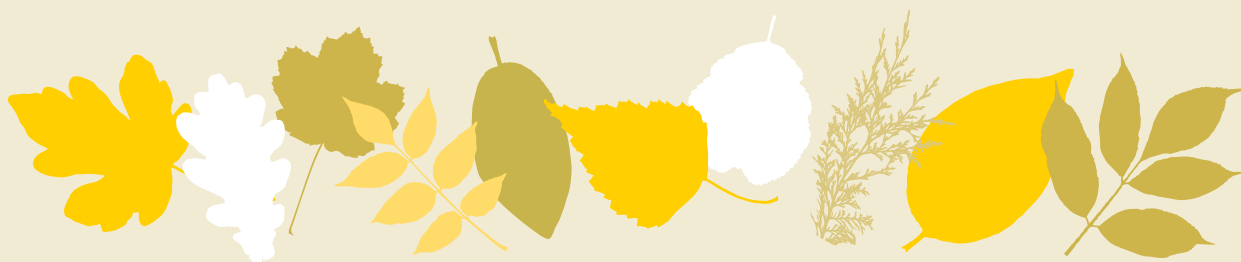
## THE ROLE OF CITIZENS/PEOPLE POWER

We recognise the important role of citizens in helping to manage and grow our urban forest.

Trees and woodlands that are loved and cared for by our citizens will be less vulnerable.

Community forestry activity provides an ideal opportunity to engage people in trees, woods and the natural environment, and can have great benefits for our trees and our citizens.

Community forestry should be integrated with approaches to improving public health.





### 1.3 DELIVERING THE STRATEGY – OUR COLLECTIVE ACTION

Protecting and expanding our forest canopy is an urgent task and, while local government has a role to help plan and facilitate action, there are responsibilities at all levels; they are all our trees.

#### RESIDENTS

- If you have a garden, consider planting a tree appropriate to the space.
- Get involved – look for local volunteer programmes such as City of Trees' **Citizen Forester**<sup>18</sup>, or **TCV**<sup>19</sup>.
- Contact your local authority to explore opportunities for planting street trees.
- Understand that trees may be protected through Tree Preservations Orders (TPOs), and where work is being undertaken on large veteran trees, check with your local authority to ensure permission has been granted.
- Consult guidance before taking action to remove trees at home – ensure any tree works are undertaken by proof of insurance and follow Arboriculture and Forestry Advisory Guidance.
- See City of Trees' **'How to...'**<sup>20</sup> guides for practical advice on a range of ways to help protect and expand our urban forest.

#### BUSINESSES

- Investigate opportunities to support tree planting or tree management close to your business.
- Identify opportunities for staff to get involved in tree and woodland volunteering programmes such as City of Trees' **Citizen Forester**<sup>21</sup> or Lancashire Wildlife Trust's **Welly Workouts**.<sup>22</sup>
- Donate to local tree planting projects.
- If a business (or local authority) wants to report their mitigation efforts against their carbon emissions, they should consider supporting the Woodland Carbon Code, a validated scheme that allows a company to make verifiable statements about the carbon capture that has been achieved through creating new woodland.

#### THIRD SECTOR ORGANISATIONS

- Support partner organisations to deliver tree planting and woodland management.
- Support and promote the development of Forest School activities.

#### SCHOOLS

- Undertake assessment of planting opportunities on school land.
- Support development of Forest School activities and development of outdoor education area at your school.

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18 <http://www.cityoftrees.org.uk/volunteer>

19 <https://www.tcv.org.uk/north/volunteering-north>

20 <https://www.cityoftrees.org.uk/resource/how-guides>

21 <http://www.cityoftrees.org.uk/volunteer>

22 <https://www.lancswt.org.uk/support-us/business/teambuilding-and-employee-volunteering>

## DEVELOPERS AND CONTRACTORS

- Wherever possible integrate existing trees into new developments, increase levels of high-quality tree planting and ensure trees are well maintained.
- Ensure adequate protection of trees during construction/demolition or other site works.
- Undertake more mitigation and compensation planning before submitting applications, reporting environmental impacts clearly and transparently, and submitting fewer inappropriate applications (i.e. those that show a clear net loss for biodiversity).
- Trees may be protected through Tree Preservations Orders (TPOs) or by being designated within conservation areas; please check with the local authority before undertaking works to tree or with potential to cause damage.

## LANDOWNERS

- Explore opportunities for using your current agri-environment agreements or novel funding streams, such as [Woodland Carbon Fund](#)<sup>23</sup>, and [Woodland Carbon Code](#)<sup>24</sup> to fund woodland planting on your land.
- Contact [Northern Forest](#)<sup>25</sup> for more advice and support with woodland creation in your area.
- Ensure management plans are in place in order to benefit from funding opportunities.
- Recognise value of existing trees on your land and potential value of your land to provide essential ecosystem services – build natural capital value into asset management.
- Seek professional advice to develop risk-based plans for managing and replacing ash and other trees threatened either by disease or old age. Refer to [Section 4](#) of this strategy for guidance.

## GREATER MANCHESTER'S LOCAL AUTHORITIES – THE DISTRICTS

Local authorities could consider rethinking their land portfolio. Selling valuable and developable land may enable them to buy other land for woodland creation and allow them to accommodate extra woodland creation.

There is a range of other areas of responsibility where local authorities are well placed to take action on trees:

## HIGHWAYS MANAGEMENT

- Recognise street trees as assets and factor in the benefits of trees on highways when considering adoption fees.
- Ensure contractors take care and work to recognised standards when working around existing trees. Refer them to [Section 4](#) of this strategy.
- Identify further opportunities for planting street trees.
- Continue to work with Transport for Greater Manchester (TfGM) to incorporate trees into street design, helping them implement streets for all and Bee Networks.
- Plant trees and hedges around our schools and busy roads, using careful design to reduce exposure to harmful air pollutants.

<sup>23</sup> <https://www.gov.uk/guidance/woodland-carbon-fund>

<sup>24</sup> <https://www.woodlandcarboncode.org.uk>

<sup>25</sup> <https://thenorthernforest.org.uk/get-involved/>



## PLANNING AND DEVELOPMENT MANAGEMENT

- Recognise the importance of mature trees and that loss of mature trees means loss of benefits and decreased resilience.
- Enforce National Planning Policy Framework (paragraph 118) statements on protection of irreplaceable habitats.
- Move toward a natural capital approach when considering proposals for tree losses and replacements – moving beyond basic numeric replacement conditions.
- Refer developers to this document and request that proposals consider the value of trees on development sites.
- Ensure developers contribute to cost of establishment and maintenance of new trees.
- Refer to planting priority maps in [Section 3](#) when considering options for replacement of mitigation planting, or net gain proposals relating to offsite gain.
- Contribute records of trees lost and trees planted through development.

National Planning Policy Framework (NPPF, 2012) states in paragraph 118: “...planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including Ancient Woodland and the loss of aged or veteran trees found outside Ancient Woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss.”

## GREENSPACE AND LAND MANAGEMENT

- Develop or support approaches to actively engage citizens in monitoring and protection of their local trees.
- Build on the guidance in this strategy by developing guidance for residents and landowners to help avoid conflicts.
- Support partner organisations to deliver tree planting and woodland management.
- Be proactive in the use and promotion of mechanisms to protect existing trees.

## POLICY SETTING

- Recognise the value of mature trees to the economy and citizens of Manchester and endorse the principles of this strategy.
- Develop or review your own strategies or policies on trees and woodlands, to reflect them alongside your own local priorities.
- Support better monitoring of numbers of trees lost and new trees planted.
- Support third sector and community forestry to ensure woodlands are managed.
- Support collaborative working through the Greater Manchester Forests Partnership, to identify areas of best practice and ways to make the most effective use of resources.
- Where possible and relevant, build upon the guidance presented in [Section 4](#), to develop common guidance on topics such as dealing with disputes.
- Support establishment and maintenance of Forest Schools close to educational sites.
- Develop published strategy or guidance, based on the principles presented in this strategy.

## SOCIAL HOUSING PROVIDERS

- Strive to maintain and protect existing trees on land holdings, plant more trees and engage residents in tree planting and management.
- Develop clear tree policies – and resist requests for tree removal based on spurious reasons, such as leaf drop, attracting birds/insects.

## GREATER MANCHESTER HEALTH AND SOCIAL CARE PARTNERSHIP (GMHSCP)

- Develop social prescribing programmes that involve physical contact with trees and woodlands.
- Promote volunteering on prescription and work with the environment sector to develop referral criteria and network of trusted delivery partners.

## GREATER MANCHESTER FORESTS PARTNERSHIP

- Develop the Greater Manchester Tree and Woodland Strategy and work with partners to embed it at a local level in policy and to then support its delivery. This includes woodland management and widespread tree planting to contribute to Greater Manchester's initial three million target as part of the Northern Forest; as well as tree planting in towns and cities to increase the resilience of our urban centres.
- Continue to work with TfGM to incorporate trees into street design, helping them implement streets for all and Bee Networks.
- Provide online 'tree' advice for developers, landowners and residents through a series of 'how to' guides – <http://www.cityoftrees.org.uk/resource/how-guides>

## GREATER MANCHESTER COMBINED AUTHORITY

- Continue to include trees as an integral component in future Greater Manchester policies/strategies.
- Ensure importance of preserving existing trees is communicated through all its strategies.
- Support districts to develop their own tree and woodland strategies.
- Influence central government to make funding and support (via its agencies) available for planting and management of trees.
- Develop and support large-scale greenspace and woodland projects such as City Forest Park and the Northern Forest.
- Actively support identification and release of land for tree planting.

## CENTRAL GOVERNMENT

- Launch a programme of innovative funding mechanisms to deliver increased investment in nature-based adaptation solutions.
- Release funding for accelerated programme of tree-based natural flood management.
- Support mandatory net gain, when considering impact of developments on ecosystem benefits, which encourages tree planting.
- Develop mechanisms to incentivise the release of land for tree planting.
- Encourage reduction in the use of non-renewable resources with wood and timber product.



## 1.4 FUNDING

Funding Green Infrastructure is becoming increasingly challenging as public sector resources reduce. Outside the public sector, investment in natural capital has traditionally drawn upon philanthropic sources such as trusts and foundations, NGOs and lottery funds. The way the protection and enhancement of our natural environment is funded needs to change.

Greater Manchester was identified as the Urban Pioneer as part of the Government 25 Year Environment Plan. This means we have been testing new tools and methods for investing in and managing the natural environment.

Funding opportunities and mechanisms are changing all the time, so the information below can only provide a snapshot of current and anticipated opportunities and will therefore need to be updated as conditions change.

Outside of urban areas, over 7,000 hectares (or 5.6% of the city region's total land area) of land is managed under agri-environment agreements, which provide funding for farmers, woodland owners, foresters and land managers to make environmental improvements to land. The **Countryside Stewardship Woodland Creation Grant**<sup>26</sup> is a capital grant, where applicants can apply for one-off payments for the trees which will be planted and any associated protection items and support towards infrastructure to help the establishment of new woodland. Once the woodland is planted and the final capital claim is paid, eligible applicants can apply for a separate multi-year grant to maintain the newly created woodland for 10 years.

Woodland larger than 10 hectares should be designed using the **Woodland Creation Planning Grant**<sup>27</sup> (WCPG). This grant provides funding to prepare a Woodland Creation Design Plan that complies with the UK Forestry Standard, which can subsequently be used to support further woodland creation grant applications.

The **Woodland Carbon Fund**<sup>28</sup> (WCF) supports the planting of productive, multi-purpose woodlands that are larger than 10 hectares, to store carbon. The scheme offers capital funding for the creation of new woodland including the costs of tree planting and protection items including tree guards, fencing and gates. Funding is also available to install forest roads and recreational infrastructure

If the woodland creation is not being used to directly offset emissions, landowners may want to earn further income by selling carbon credits – known as Woodland Carbon Units (WCUs) – from their project. They will need to register their woodland with the **Woodland Carbon Code**<sup>29</sup> before they start planting, so that the potential opportunities for future revenues from the developing UK carbon market are not missed.

The **Woodland Carbon Guarantee**<sup>30</sup> (WCaG) is an incentive scheme which will provide long-term (35 years) payments for carbon sequestration to landowners in England who plant new woodlands. The WCaG offers successful participants the option to sell woodland carbon units to government at a guaranteed price set by auction, which may be above current market rates. The guarantee holder will also have the option to sell the WCUs on the open market. Registration is open year-round and participation in the scheme will be through periodic auctions which will be advertised online.

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26 [www.gov.uk/government/publications/woodland-creation-grant-countryside-stewardship-from-10-september-2018](https://www.gov.uk/government/publications/woodland-creation-grant-countryside-stewardship-from-10-september-2018)

27 [www.gov.uk/guidance/woodland-creation-planning-grant](https://www.gov.uk/guidance/woodland-creation-planning-grant)

28 [www.gov.uk/guidance/woodland-carbon-fund](https://www.gov.uk/guidance/woodland-carbon-fund)

29 [www.woodlandcarboncode.org.uk](https://www.woodlandcarboncode.org.uk)

30 [www.gov.uk/guidance/woodland-carbon-guarantee](https://www.gov.uk/guidance/woodland-carbon-guarantee)

The **Urban Tree Challenge Fund**<sup>31</sup> (UTCf) provides funding to support the planting and establishment of large and small trees in urban and peri-urban areas in England. The fund is competitive and targeted at projects that can provide the greatest environmental, social and economic benefits in our towns and cities. The fund offers up to 50% of published standard costs to support the planting and establishment of urban and peri-urban trees. The UTCf is a challenge fund, which means applicants are required to provide at least 50% match funding from other sources, which can be in the form of money or labour.

**Environmental Land Management**<sup>32</sup> – While there is still only limited information about how this scheme will eventually look, the government has made it very clear that it wishes to phase out direct payments to farmers and shift funding into new Environmental Land Management Schemes (ELMS). The direction of travel for a new British Agricultural Policy is about moving to a system of paying “public money for public goods”.

**Northern Forest**<sup>33</sup> – Partner Innovation Fund provides kick-start funding to collaborative tree planting projects.

**Development** – Developers should contribute to cost of planting, establishment and maintenance of new trees. S.106 agreements between the developer and the planning authority are one existing mechanism. Biodiversity Net Gain obligations are expected to be embedded in the planning system for housing and infrastructure developments. This could see a system of conservation credits which are pooled into a habitat bank for purchase by developers to offset the environmental loss from development schemes.

**Enforcement undertakings** – The Environment Agency has powers to apply civil penalties for environmental offences whereby contributions are made to fund environmental improvements, which may include tree planting.

#### **Other investment opportunities:**

- GMCA is supporting the development of a **Greater Manchester Environment Fund**, which would provide the opportunity to invest in projects delivering environmental benefits across Greater Manchester.
- Novel mechanisms to deliver **increased investment in nature-based adaptation solutions** are being explored as part of the IGNITION project.
- The **Greater Manchester Natural Capital Investment Plan** aims to broaden the range of potential sources of investment in natural capital, increasing their accessibility to attract potential investors.
- Where tree planting is being designed to **promote flood resilience**, it may be possible to access Defra or Regional Flood and Coastal Committee local levy funds.

31 [www.gov.uk/guidance/urban-tree-challenge-fund](http://www.gov.uk/guidance/urban-tree-challenge-fund)

32 [www.deframedia.blog.gov.uk/2020/02/25/new-details-of-the-flagship-environmental-land-management-scheme-unveiled-by-environment-secretary/](http://www.deframedia.blog.gov.uk/2020/02/25/new-details-of-the-flagship-environmental-land-management-scheme-unveiled-by-environment-secretary/)

33 [www.thenorthernforest.org.uk/delivery](http://www.thenorthernforest.org.uk/delivery)



## 1.5 MONITORING THIS STRATEGY – MEASURING SUCCESS

It is proposed that this strategy, targets and actions are reviewed every five years. Every 12 months, the Greater Manchester Forests Partnership will submit a progress report to the GMCA highlighting what has been achieved in terms of numbers of trees planted and woodlands brought back into active management for community use. This will form the basis for reviewing and guiding target planning and priorities for the following years.

Monitoring our progress will be a challenge. While we may be able to get a fairly good idea of how many trees are being planted, we don't know how many are being lost. Long-term change may be picked up by use of satellite imagery and application of statistical techniques. In order to react quickly, however, it may be necessary to develop better communication between Greater Manchester's planning authorities and the Forests Partnership, in order to maintain good records of losses and gains to our urban forest.

### A NOTE ABOUT PLANTING TARGETS

The relative merits of canopy cover targets and simple numeric targets are subject to ongoing debate among all those involved in tree management. While we are keen to understand the extent of Greater Manchester's canopy area and, ultimately, increase this area, new planting takes several years to form a mature canopy and means that change can only be monitored over longer timescales. Also, there is no target, whether it is numeric or aerial, that represents 'enough'. Tree populations are dynamic, and we will always have to think about the next generation of trees.

Our target of three million trees planted – one for every person living in Greater Manchester – gives us a useful metric for engaging people and catalysing action, and one that we can more easily measure our progress toward.

The downside is that, unlike a canopy target, planting targets don't account for tree losses. Holding to the principle that we plant trees where they are needed most will help ensure we increase benefits from trees in the longer term. And in the meantime, we will support the development of ways to monitor losses and review the effectiveness of our target as we go.

Having already undertaken a canopy survey using i-Tree means that we will be able to use the existing framework to easily repeat the process to monitor long-term change in our forest canopy. This is an active area of research and the University of Birmingham is developing a software platform with urban practitioners to enable them to predict quantitatively the impacts of a range of interventions on exposure, on a site-by-site basis.





## SECTION 2 – GREATER MANCHESTER'S TREES – THE EVIDENCE BASE





## 2.1 WHY ARE TREES SO IMPORTANT?

Trees and woodland can play a significant role in creating resilient and healthy city regions. The City of Trees i-Tree survey in summer 2018, and subsequent report, found that there were approximately 11.3 million trees in Greater Manchester. These were made up of 192 species – the three most common were hawthorn, sycamore and English oak. The combined tree canopy across Greater Manchester covers 15.7% of the region's land surface. The benefits that these trees provide are outlined below.

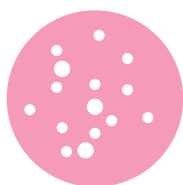
### CARBON SEQUESTRATION AND STORAGE



Carbon sequestration is the removal of carbon dioxide from the air by plants. Trees store carbon in all woody tree tissue – root stem and branches. Trees therefore have a significant influence on the balance of carbon in the atmosphere, absorbing and then storing carbon, sometimes for centuries. One tree can absorb several tonnes of atmospheric carbon dioxide during its lifetime.

An estimated 1,573,013 tonnes (approximately 12.3t/ha) of carbon is stored in Greater Manchester's trees with an estimated value of £374,935,529. This is the equivalent to the carbon emitted across Greater Manchester in 238 days.

### AIR QUALITY



Air pollution caused by human activity is a massive problem that is growing through increased use of vehicles and large populations concentrated in towns and cities. The impact of pollutants on poor health are well documented as well as the damage pollution causes to buildings.

Trees make a contribution to improving air quality by removing pollutants from the air, absorbing them through the leaf surfaces and by capturing particles such as pollen and dust. Also, by reducing air temperature, trees can reduce the levels of ozone produced at ground level. i-Tree estimates that the total level of air pollution removal across Greater Manchester with our current tree stock is 847 tonnes, or the combined annual emissions from 2,000 average cars.

It's worthy of reference here that the fraction of pollution removed by deposition in the urban environment is typically just a few per cent, owing to the small scale of realistic planting schemes and the relatively slow rate of transfer of pollution particles and molecules to (leaf) surfaces. A less well understood value of Green Infrastructure for urban air quality lies in its ability, not to remove pollution, but rather to control its distribution by strategically enhancing (or reducing) its dispersion close to its source. Meanwhile, certain interventions will reliably reduce exposure, as described in the technical paper, [First Steps in Air Quality for Built Environment Practitioners](#).<sup>34</sup>

### CLIMATE REGULATION – URBAN COOLING



Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration. Shaded surfaces may be 11–25°C cooler<sup>35</sup> than the peak temperatures of unshaded materials. Reducing temperatures also reduces the need for air conditioning and so helps to reduce emissions.

<sup>34</sup> <http://www.tdag.org.uk/first-steps-in-urban-air-quality.html>

<sup>35</sup> Akbari, H., D. Kurn, et al. 1997. Peak power and cooling energy savings of shade trees. *Energy and Buildings* 25:139–148.

## CLIMATE REGULATION – WATER QUALITY MANAGEMENT



Surface water flooding occurs when rainfall runs off land and buildings at such a rate that it is unable to drain away in streams, rivers, drains or sewers. Rainwater runs off every built environment, gathering urban pollutants before joining streams and rivers.

Trees have the potential to ‘capture’ an amount of water during rainfall events, which is held in the canopies of the trees. After these rainfall events, this moisture is then re-evaporated into the atmosphere. Some of the rainfall will also be directed down the tree’s network of branches and stems directly into the soil at the base of the tree. A reduction in the total amount of surface water that would otherwise find its way into the sewerage system means a saving in treatment costs but also a reduction in volumes of untreated sewage being discharged into rivers from sewers during periods of heavy rainfall.

Greater Manchester trees have a leaf area of approximately 859.1 km<sup>2</sup> – equivalent to 120,300 Old Trafford football grounds. The effect of this leaf area is to produce an avoided runoff of some 1,644,415 m<sup>3</sup> per year. This is the equivalent of more than 657 Olympic-sized swimming pools.

## HEALTH AND WELLBEING



There is a growing body of research that highlights the positive impacts that being outdoors and in green spaces can have for us – both on our physical and mental health. This includes research relating specifically to trees – from hospital patients recovering more quickly if they can view trees through to our stress levels reducing as we take in the sights, sounds and smells of a woodland and our interest and senses are stimulated.

In addition, we are more likely to walk and cycle about if we have attractive outdoor spaces with trees, making these forms of exercise and travel more attainable. Trees of course are also a source of the healthy food that we need, with urban orchards providing opportunities for sustainable and community-focused food production.

A **recent study**<sup>36</sup> from Australia found that the residents of neighbourhoods with a higher amount of tree canopy had better mental and general health but didn’t find the same correlation when the type of green space was open, grassed areas.

## HABITAT AND WILDLIFE



Trees provide much needed habitats to encourage biodiversity – providing homes for a range of wildlife from insects and birds to small mammals. Trees and shrubs can provide green corridors for wildlife to move across, connecting rural areas with town and cities and ensuring that species can find partners to breed, forage for food and find homes.

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36 <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2739050>

## CLIMATE REGULATION



Trees can play an important part in moderating the urban climate and environment:

- Mitigating the heat caused through urban activity by lowering the temperature under the tree canopy during summer months.
- Creating shade in otherwise open areas with the additional benefit of reducing ultraviolet radiation.
- Reducing wind speeds in winter could improve urban environments, potentially making areas safer and more attractive to spend time in. Trees that shelter buildings also have the potential to reduce energy consumption and heating costs.

## IMPROVING PLACES



Trees and woodland create attractive environments that boost civic pride and a unique identity for towns and cities.

**Research**<sup>37</sup> has highlighted the 'linger' effect of trees in urban centres – people are more likely to use areas as leisure facilities and browse and shop in areas and streets lined with trees. Good aesthetic quality can increase land and property value as well as improving opportunities for eco-tourism.

A programme of scientific studies has found that shoppers respond positively to trees in downtown business districts – the 'linger' effect. These findings have been consistent across large, small and mid-size cities of the United States. The most positive consumer response is associated with streets having a mature, well-managed urban forest where overarching tree canopy helps create a 'sense of place'.

## MAXIMISING BENEFITS



To fully realise these benefits it is important to remember that all trees are not equal. Larger trees with bigger leaf canopies will offer much more in terms of carbon sequestration and climate regulation, as well as hosting a wide range of wildlife. Larger trees are also often the ones that people have a connection with, maybe through observing them throughout their lifetime or just appreciating their heritage value. Healthy trees are also much more valuable.

Trees will also offer more to urban populations if they are located nearby – to help manage the different benefits. Currently access to trees and greenspaces is very unequal across Greater Manchester, with poorer areas having less. For benefits to be equally realised more trees need to be planted in these areas.

37 <http://naturewithin.info/New/2014.City-Trees-and-Consumer-Response.Bk%20Chapt.Wolf.pdf>



## 2.2 GREATER MANCHESTER'S URBAN FOREST

### A LITTLE HISTORY

Greater Manchester is often thought of in terms of its built environment and its industrial heritage. However, the area also supports a rich, diverse natural heritage from moorlands in the north and east, species-rich grasslands and wetlands in the south-west, with scattered trees and woodlands distributed across the city region. The industrial heritage has left a legacy of unusual habitat mosaics including railway sidings, canals, historic landfills and areas of derelict land.<sup>38</sup>

Manchester's first community forests, Red Rose Forest (now City of Trees) and **Pennine Edge Forest**<sup>39</sup>, were established in the 1990s by the then Countryside Commission to demonstrate the potential contribution of environmental improvement to economic and social regeneration. Since then, community forestry has helped Greater Manchester be a world leader in restoring previously degraded sites. Extensive new tree planting over the last 30 years has provided new and enhanced places for public recreation, improved air quality and reduced flood risks. This has led to sometimes dramatic increases in the populations of some species associated with woodland such as greater spotted woodpeckers and long-tailed tits.

### WHERE IS GREATER MANCHESTER'S URBAN FOREST?

Greater Manchester's woodlands vary in character, from upland oak woods to wet woodland, and from ancient broadleaved woodland to plantation and young woodland. Some important woodlands in Greater Manchester have been designated for their nature conservation interest, e.g. Sunbank Woods near Manchester Airport, but many more woodlands are unprotected.

The 2010 Greater Manchester Tree Audit mapped out all of Greater Manchester's woodlands and individual trees and told us that around 16% of Greater Manchester is covered by tree canopy. The average urban tree canopy cover in England is 16%. However, it varies massively depending on where you live; from 3% in Fleetwood, Lancashire, to 45% in Farnham, Surrey.

However, tree cover in Greater Manchester isn't distributed evenly, with our most densely populated areas and areas of unemployment having very low tree cover. The important contribution of river valleys as linear woodlands evident in **Map 1**, shows distribution of woodlands across Greater Manchester. Less obvious are the large numbers of trees in our parks, our gardens, and lining our streets.

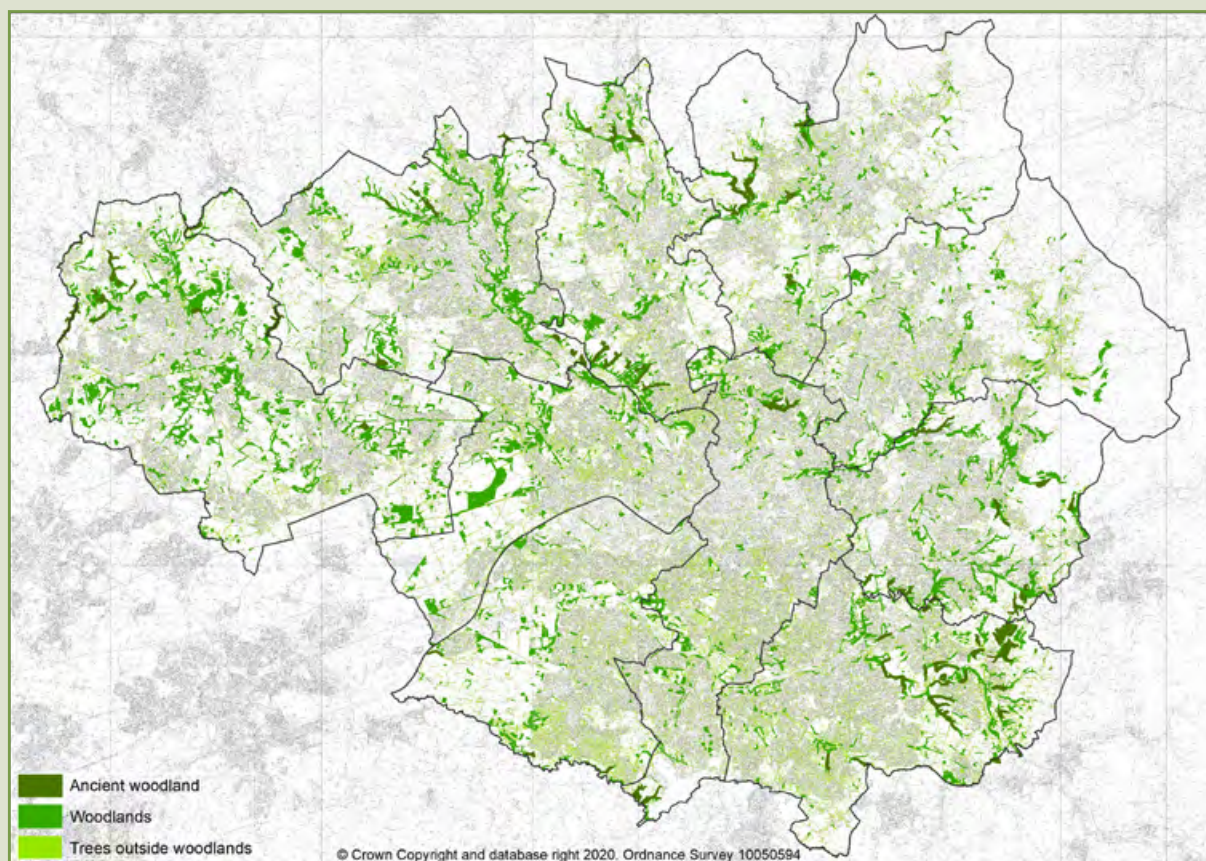
**Map 2** shows the proportion of canopy cover by local authority ward and shows that there are large differences in tree cover across Greater Manchester.

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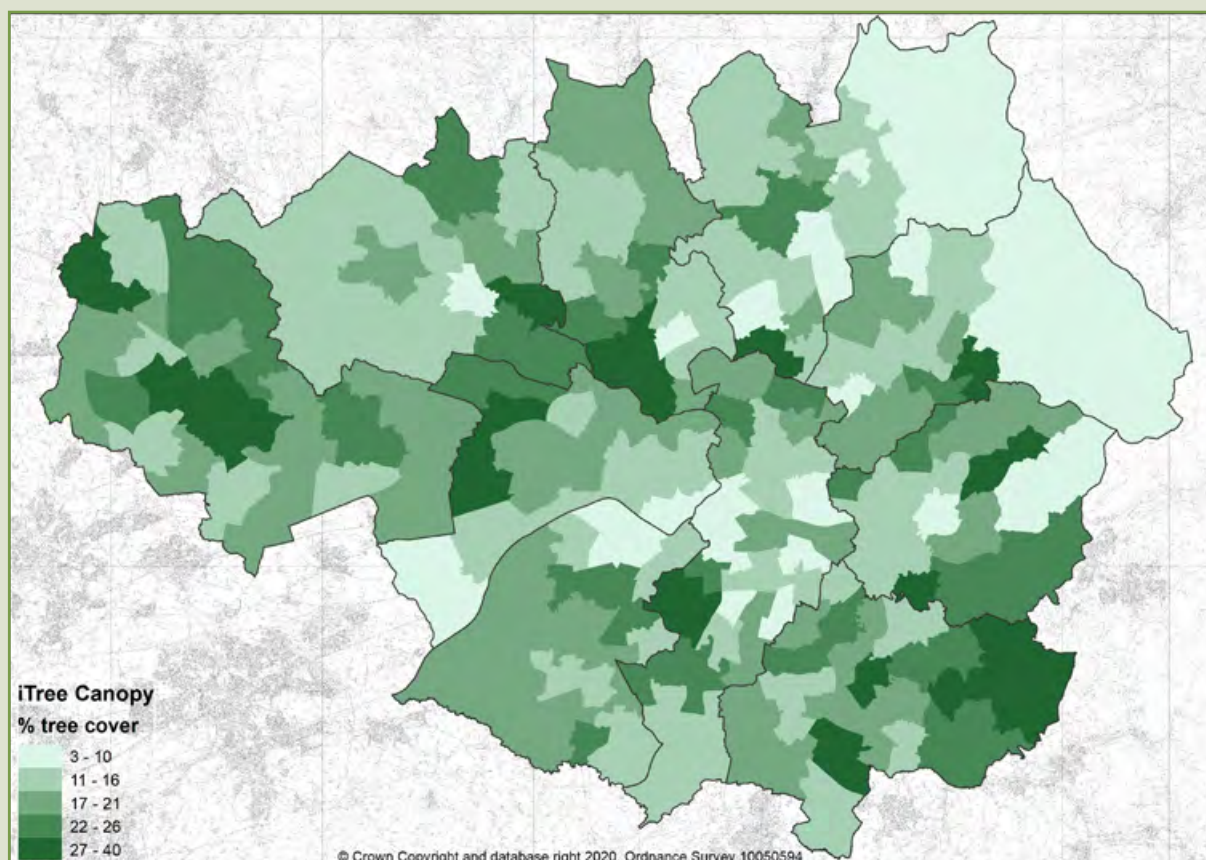
38 GMEU Priority Green Infrastructure – report for GMSFs

39 [www.pennineedgeforest.org.uk](http://www.pennineedgeforest.org.uk)

MAP 1: MAP OF WOODLANDS



MAP 2: TREE COVER BY WARD





## ORCHARDS

Technically, consisting of six or more fruit trees, orchards can comprise of a mix of tree, shrub and grassland habitats and are home to a wide range of biodiversity including insects, birds and bats. In urban areas, orchards provide an opportunity for people to access fresh fruit for free, to make the link between their environment and the food they eat, and offer training opportunities.

Greater Manchester is not known for its fruit-growing heritage in the same way as, say, Kent. There is however, a rich history of locally-distinct fruit production supplied to some of the famous local markets like Wigan and Bury. The [National Orchard Inventory](#)<sup>40</sup> lists 99 traditional orchards in Greater Manchester, covering an area of 21.91ha. A [survey](#)<sup>41</sup> by the Greater Manchester Ecology Unit<sup>42</sup> in 2015 found that approximately 13% of Greater Manchester's orchards were in 'excellent' condition, 53% in 'good' condition and 34% in 'poor' condition (see [Table 1](#)).

The [Orchard Project](#)<sup>43</sup> is working to restore heritage orchards in Greater Manchester, and plant new ones, working with 20plus 'Friends of' groups across Greater Manchester.

**TABLE 1. GREATER MANCHESTER ORCHARD QUALITY BY DISTRICT – GREATER MANCHESTER ORCHARD PROJECT**

	Total traditional orchards ground-truthed	Remaining traditional orchards	Orchards no longer present	Orchards still to survey	% Habitat Condition = Excellent	% Habitat Condition = Good	% Habitat Condition = Poor
Bolton	2	1	1	1	100.0	0.0	0.0
Bury	9	5	4	0	20.0	40.0	40.0
Manchester	4	4	0	4	25.0	75.0	0.0
Oldham	0	0	0	0	0.0	0.0	0.0
Rochdale	0	0	0	0	0.0	0.0	0.0
Salford	1	1	0	0	0.0	100.0	0.0
Stockport	19	15	4	3	13.0	47.0	40.0
Tameside	10	8	2	4	0.0	62.5	37.5
Trafford	15	15	0	4	21.5	57.0	21.5
Wigan	21	19	2	2	0.0	53.0	47.0
Total	81	68	13	18	13.2	52.9	33.8

40 <http://publications.naturalengland.org.uk/file/80011>

41 [https://www.gmwildlife.org.uk/resources/downloads/grafting\\_for\\_orchards\\_evaluation.pdf](https://www.gmwildlife.org.uk/resources/downloads/grafting_for_orchards_evaluation.pdf)

42 [https://www.gmwildlife.org.uk/resources/downloads/grafting\\_for\\_orchards\\_evaluation.pdf](https://www.gmwildlife.org.uk/resources/downloads/grafting_for_orchards_evaluation.pdf)

43 <https://www.theorchardproject.org.uk>

## 2.3 WHAT ARE ALL OUR TREES DOING FOR US?

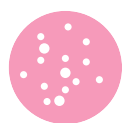
To manage and protect our existing trees better, it was important to understand not only where our trees are, but what types of trees make up Greater Manchester's urban forest canopy, what condition they are in, and assess the extent to which they are delivering ecosystem services to the economy and people of Greater Manchester.

To do this, City of Trees used the i-Tree Eco method of tree ecosystem service valuation. This method was developed by the US Forestry Service and adapted for use in Britain by the UK's Forest Research. This method uses data from sample plots to generate a model of the composition, structure and condition of the entire forest canopy, and quantifies the scale and cash value of carbon storage, pollution removal, carbon sequestration, and avoided runoff benefits.

Between May and November 2018, data on species, mass and condition was collected from more than 6,000 trees across Greater Manchester. City of Trees recruited and coordinated a team of 57 surveyors who visited almost 2,000 sample plots.<sup>44</sup> This is thought to be the largest ever i-Tree survey undertaken outside the US and is around three times the size of Greater London's, in terms of number of plots surveyed.

While data below are presented to illustrate the Greater Manchester's forest canopy as a whole, the study was undertaken so as to facilitate the presentation of data disaggregated to each of the 10 districts, for use in developing district-specific local plans and policies.

### I-TREE RESULTS SUMMARY



Greater Manchester's trees act as a filtration system for harmful air pollutants – removing 847 tonnes of pollutants each year.



They assist with excessive storm water, intercepting 1.6 million cubic metres of storm water runoff per year.



Greater Manchester's trees sequester 56,530 tonnes of carbon each year and the current carbon of all the trees in the region is 1,573,015 tonnes.



They produce 122,450 tonnes of oxygen each year.



The total annual economic value of air pollution filtration, storm water attenuation and carbon sequestration in Greater Manchester's trees is £33,298,891.



It would cost over £4.7 billion to replace all Greater Manchester's trees like for like.

44 Full methodology is available from City of Trees.



## CANOPY STRUCTURE

### TREE POPULATION

Across Greater Manchester there are an estimated 11,321,386 trees. The trees that make up this urban forest are situated on both public and private property. Across the urban area, it is estimated from the i-Tree Eco data that 29.5% of trees are in public ownership and 70.5% in private ownership.

Tree density across Greater Manchester is 89 trees per hectare. This is significantly higher than the average density of trees across London (53 trees/ha) and the current UK average for towns and cities (58 trees/ha).

### CANOPY COVER

Canopy cover can be defined as the area of tree leaves and branches covering the ground when viewed from above. At 15.7% across the study area, this is around the UK average for urban tree cover.

### TREE SPECIES COMPOSITION

Tree species composition is an extremely important metric to consider for the sustainable management of the urban forest. The diversity of species in the urban forest will influence how resilient the tree population will be to future changes, such as minimising the overall impact of exotic pests, diseases and climate change.

The three most common species across Greater Manchester are hawthorn (*Crataegus monogyna*) with an estimated 1,178,310 trees (10.4%), sycamore (*Acer pseudoplatanus*) with 976,604 trees (8.6%) and English oak (*Quercus robur*) with 903,811 trees (8.0%).

In Greater Manchester the top ten species account for 65.7% of the total population, with hawthorn making up a relatively large proportion of the total.

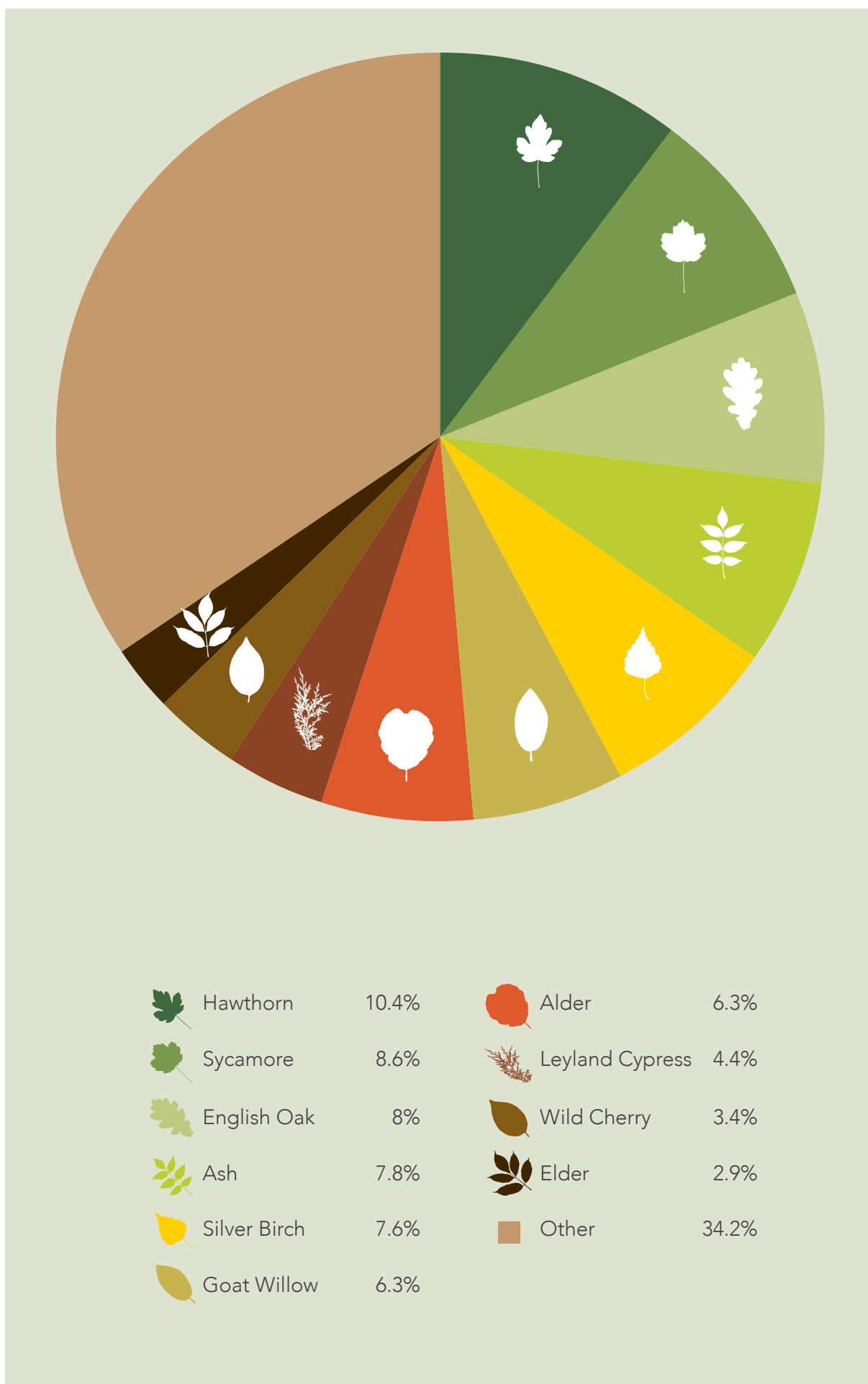
### TREE SIZE DISTRIBUTION

The size distribution of trees is another important consideration in managing a sustainable and resilient tree population, as this will ensure that there are enough young trees to replace those older specimens that are eventually lost through old age or disease.

The results also suggest a high percentage of younger trees within Greater Manchester, which is important for a resilient population when replacing older trees. If the younger specimens are allowed to reach their full potential, they should increase the canopy cover alongside the ecosystem services provided within Greater Manchester. But it is important to ensure that trees are managed to allow them to mature.



FIGURE 1: TREE SPECIES COMPOSITION



## LEAF AREA AND DOMINANCE

While the tree population statistics tell us that we have a relatively diverse and young forest canopy, the main benefits derived from trees are directly linked to the amount of healthy leaf surface area that they possess. Therefore understanding the leaf area gives us a greater understanding of the extent to which different species deliver benefits within the urban forest, and their dominance.

While sycamore and ash make up relatively high proportions of the total leaf area of Greater Manchester's forest, hawthorn have relatively low leaf area and low dominance. What this means for managing our urban forest is that, while we have a relatively young and diverse forest, the most frequent tree of all contributes only a low level of benefit. To maximise the benefits we get from our forest, we need to increase the number of larger, leafier species.

**TABLE 2: TEN MOST DOMINANT TREE SPECIES IN GREATER MANCHESTER**

Species	% Population	% Leaf Area	Dominance Value
Sycamore	8.6	16.9	25.5
Ash	7.8	8.8	16.6
Hawthorn	10.4	5.6	16
English Oak	8	7.8	15.7
Silver Birch	7.6	6	13.6
Goat Willow	6.3	5.6	12
Alder	6.3	4.7	11
Beech	2.8	7.7	10.5
Wild Cherry	3.4	3	6.4
Leyland Cypress	4.4	1.8	6.1

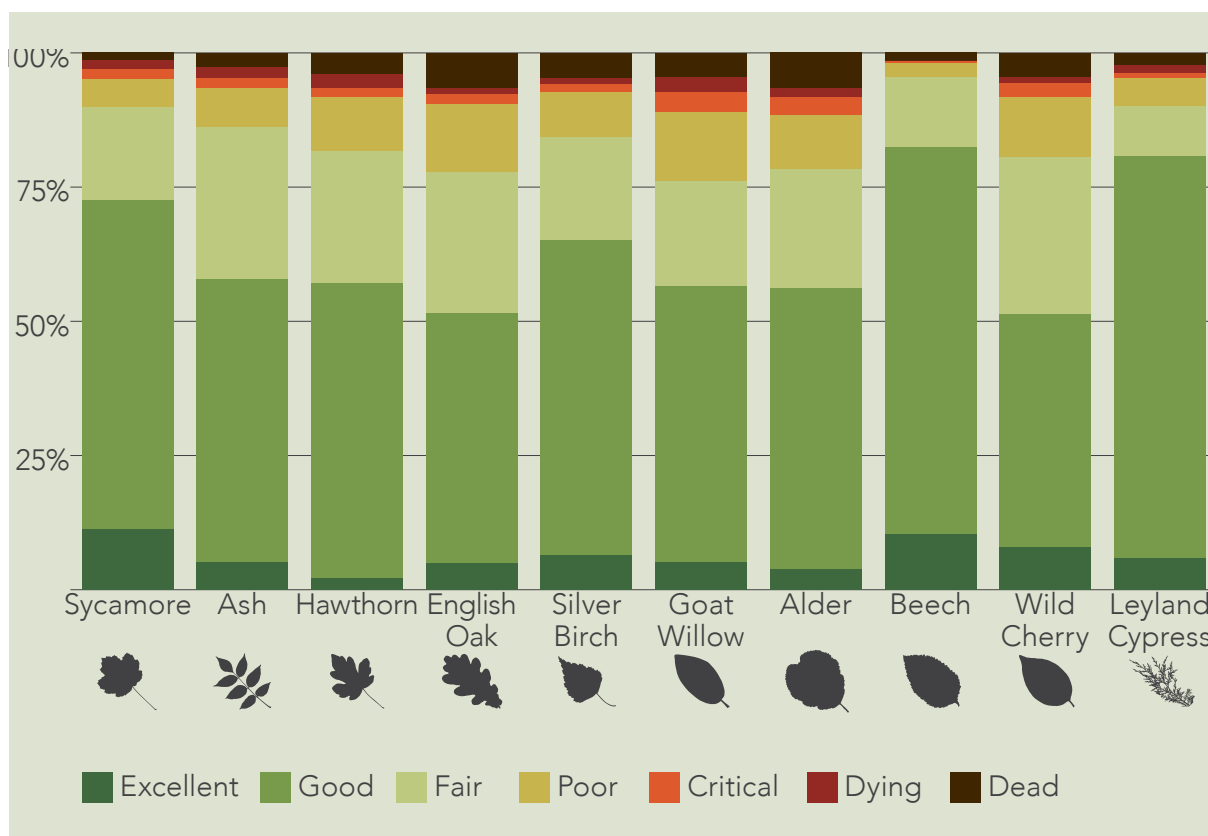
## TREE HEALTH

One of the key factors in assessing the vulnerability of the urban forest to a particular pest or disease is the overall condition of the tree population. Tree condition was measured across seven criteria (Excellent, Good, Fair, Poor, Critical, Dying or Dead) as part of the i-Tree survey'. [Figure 2](#) shows the health of the top ten most dominant species (the combination of leaf area and population).

[Figure 2](#) shows that there is considerable variability in the condition of the trees included in the Eco inventory. 71.7% of the trees assessed in the Greater Manchester inventory are considered to be in either excellent or good condition. This compares with the London i-Tree Eco study where 86% of the trees were found to be in an excellent or good condition. The reasons for this are not clear, although it would suggest Greater Manchester's trees may not be as well managed as those in London. Of particular concern is the relatively low proportion of oak and wild cherry in poor condition.



**FIGURE 2: TREE HEALTH RATING FOR THE TOP TEN TREES (BY DOMINANCE VALUE) ACROSS THE GREATER MANCHESTER STUDY AREA**



## ECOSYSTEM SERVICES

### AIR POLLUTION REMOVAL

Air pollution caused by human activity has become a growing, albeit changing, problem in our urban areas since the beginning of the industrial revolution. Initially, with the increase in population and industrialisation and latterly with the huge increase in the numbers of vehicles on our streets, it has resulted in large quantities of pollutants being produced.

The problems caused by poor air quality are well known, ranging from human health impacts to damage to buildings and smog.

Trees make a significant contribution to improving air quality by reducing air temperature (thereby lowering ozone levels), directly removing pollutants from the air, absorbing them through the leaf surfaces and by intercepting particulate matter (e.g. smoke, pollen, ash and dusts). Trees can also indirectly help to reduce energy demand in buildings, resulting in fewer emissions from gas and oil fired burners, less excess heat from air conditioning units and reduced demand from power plants.

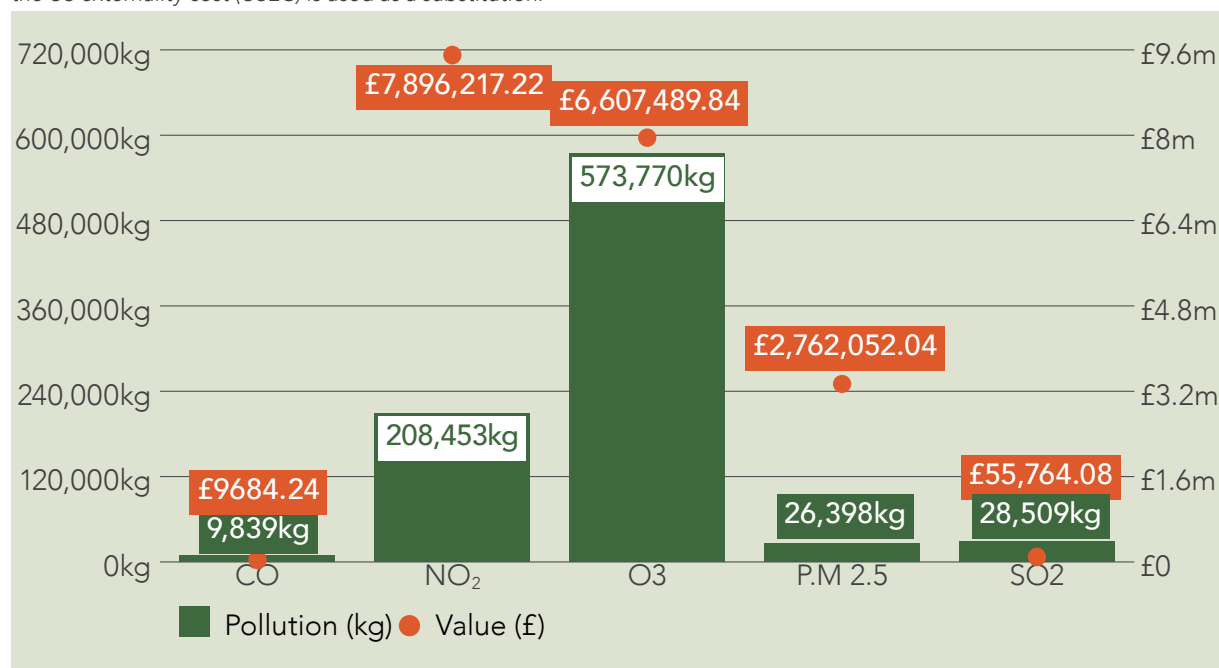
As well as reducing ozone levels<sup>45</sup>, it is well known that a number of tree species also produce volatile organic compounds (VOCs) that lead to ozone production in the atmosphere. The i-Tree software accounts for both reduction and production of VOCs within its algorithms. Although at a site-specific level some trees may cause issues, the overall effect of Greater Manchester's trees is to reduce the production of ozone through a combination of processes such as evaporative cooling.

<sup>45</sup> Nowak and Dwyer (2000)

Total pollution removal across Greater Manchester (i-Tree Eco sample survey) is estimated at 847 tonnes or 0.0066t/ha/yr (6.6kg/ha/yr). This value is substantial. By comparison, the recorded average for pollution in the same study in Greater London was 0.014t/ha/yr, Glasgow 0.050t/ha/yr and Torbay 0.0078t/ha/yr<sup>46</sup>.

**FIGURE 3: VALUE OF THE POLLUTANTS REMOVED AND QUANTITY PER-ANNUM WITHIN GREATER MANCHESTER**

Valuation methods used are UK social damage cost (UKSDC) where they are available – where there are no UK figures, the US externality cost (USEC) is used as a substitution.



Total annual amounts and pollution removal values for Greater Manchester are shown in [Figure 3](#). By quantity, removal of ozone (O<sub>3</sub> – formed by the action of sunlight on nitrogen dioxide) is greatest, with over 573 tonnes filtered from the air every year, with an associated value of over £6,607,490. By total value, the work done by trees to remove nitrogen dioxide is greatest, worth nearly £7.9 million. However, by unit value, the work done by trees to remove small particulate matter (PM2.5) proves to be of greatest benefit, worth £104.63 per kg (a total value of over £2.7 million from over 26.4 metric tonnes of particulate matter removal).

Greater tree cover, pollution concentrations and leaf area are the main factors influencing pollution filtration. Increasing areas of tree planting have been shown to make further improvements to air quality. Furthermore, because filtering capacity is closely linked to leaf area it is generally the trees with larger canopies that provide the most benefits.

## CARBON STORAGE AND SEQUESTRATION

Trees have a significant influence on the balance of carbon in the atmosphere, sequestering atmospheric carbon as they grow as part of the carbon cycle. Since about 50% of wood by dry weight is comprised of carbon, tree stems and roots can store carbon for decades or even centuries. Over the lifetime of a single tree, several tonnes of atmospheric carbon dioxide can be absorbed.

Carbon storage relates to the carbon currently held in trees' tissue (roots, stem, and branches), whereas carbon sequestration is the estimated amount of carbon removed from the atmosphere in carbon dioxide (CO<sub>2</sub>) annually by trees. Net carbon sequestration can be negative if the emission of

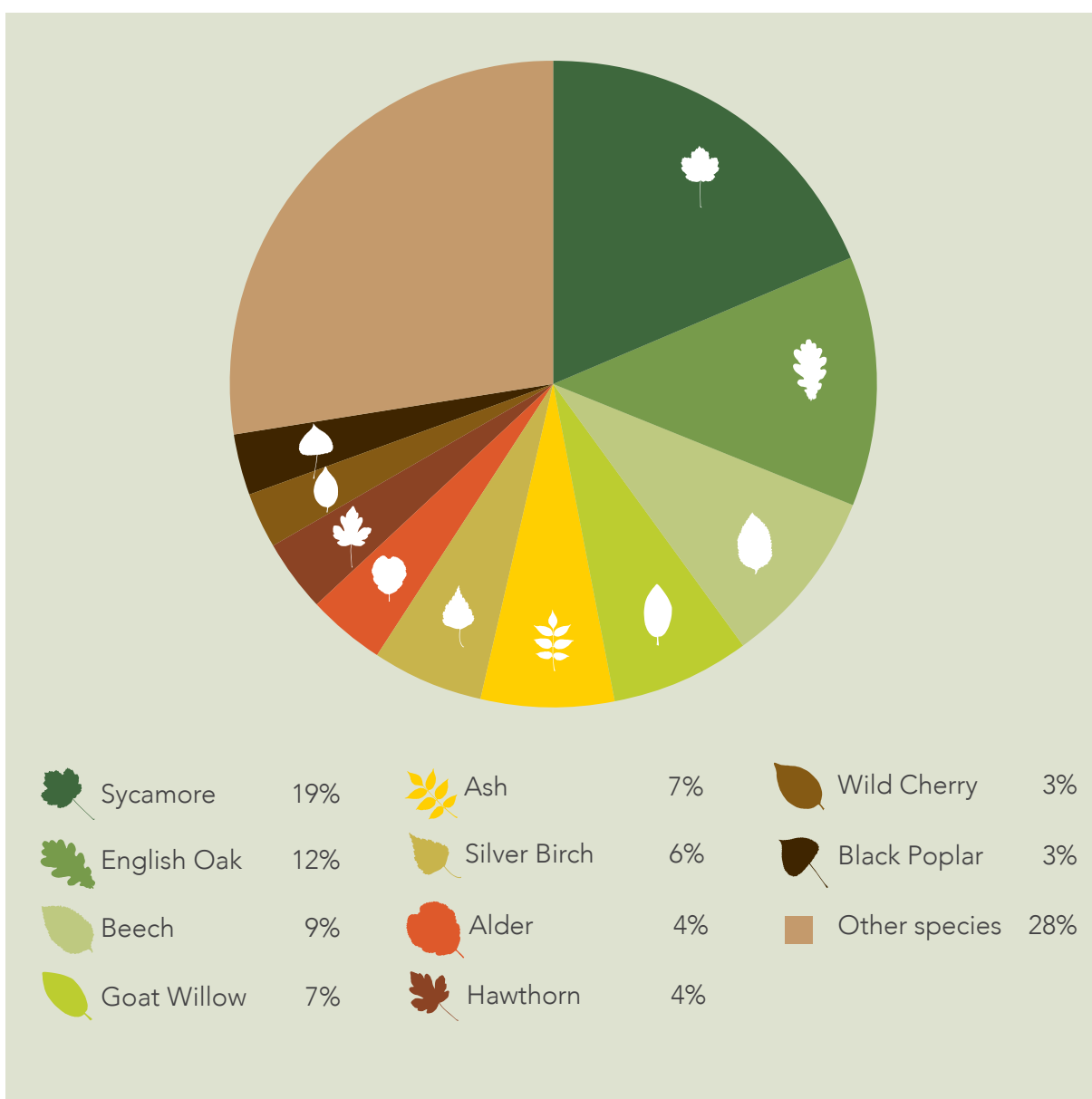
<sup>46</sup> Rogers et al (2015)



carbon from decomposition (dead trees) is greater than the amount sequestered by healthy trees. Maintaining a healthy tree population will ensure that more carbon is stored than released<sup>47</sup>, helping Greater Manchester to meet its carbon reduction pathway. Utilising the timber in long-term wood products will keep the carbon locked out of the atmosphere. Using wood to help heat buildings or produce energy will also help to reduce carbon emissions from other sources, such as power plants.

An estimated 1,573,013 tonnes (approximately 12.3t/ha) of carbon is stored in Greater Manchester's trees with an estimated value of £374,935,529. For comparison, across London, carbon storage is around 15t/ha on average.

**FIGURE 4: CARBON STORAGE (%) BY SPECIES FOR THE TOP TEN TREES ACROSS GREATER MANCHESTER**



47 Nowak et al (2002)

These results presented here are the optimum functioning of the tree biomass available but, due to environmental and other constraints, trees may be performing below this optimum. It is therefore important that the trees we currently have are managed to improve health and growth, to maximise the benefits they offer. See [Section 3](#) to understand where we should be planting more trees to maximise these benefits. For detailed information on how we should manage our existing tree stock, see [Section 4](#).

## AVOIDED RUNOFF AND ATTENUATION

Surface water flooding occurs when rainfall runs off land and buildings at such a rate that it is unable to drain away in streams, rivers, drains or sewers, or casing sewers to discharge directly into nearby watercourses. 'Runoff' occurs in the built environment from virtually every rainfall event with streams receiving frequent discharges of polluted runoff from urban surfaces (hydrocarbons, suspended solids and metals, etc.).

Trees have the potential to 'capture' an amount of water during rainfall events, which is held in the canopies of the trees. After these rainfall events, this moisture is then re-evaporated into the atmosphere. The cycle may repeat many times and water cycled in this way is diverted and thereby prevented from entering combined sewers. Some of the rainfall will also be directed down the trees' network of branches and stem directly into the soil at the base of tree. In these two ways trees attenuate or reduce runoff.

The 'value' of this benefit or ecosystem service is that if the water is diverted from the combined sewerage system then it does not have to be treated, meaning a very real saving in treatment costs and avoided energy emissions.

Greater Manchester has an estimated total tree population of 11,321,386 trees with a leaf area of approximately 859.1 km<sup>2</sup>. The effect of this leaf area is to produce an avoided runoff of some 1,644,415 m<sup>3</sup> per year. This is the equivalent of more than 657 Olympic-sized swimming pools. This avoided runoff has a value of £2,493,504 every year.

## 2.4 THREATS TO ALL OUR TREES

### PESTS AND DISEASE

Various insects and diseases can affect trees, reducing both their health and value, and therefore the sustainability of our urban forests. As most pests generally tend to have a specific range of tree hosts, the potential damage that can be caused by each pest will differ. Two diseases in particular present an immediate threat to Greater Manchester's forest canopy:

#### BLEEDING CANKER

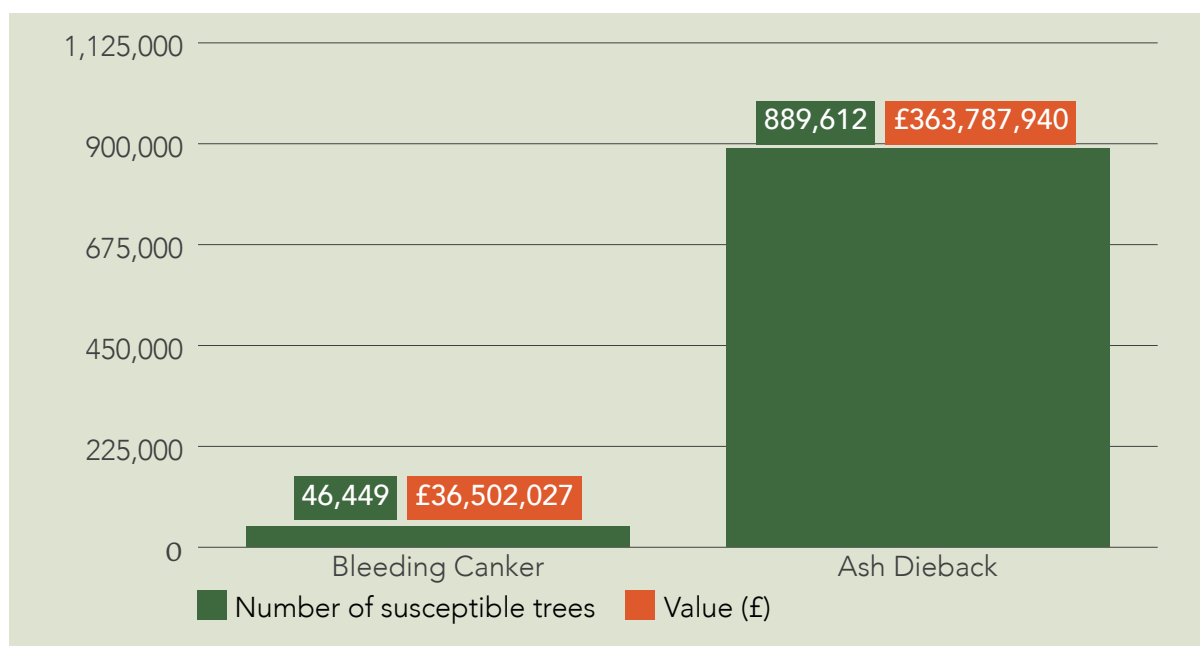
Bleeding canker is a disease that affects horse chestnut trees (*Aesculus hippocastanum*). It was first reported in Britain in the 1970s. However, its incidence has increased dramatically since 2000 with around half of all horse chestnut trees now showing symptoms. This disease could affect around 0.4% (or 46,449) of the trees in Greater Manchester.

#### ASH DIEBACK

Ash dieback, *Hymenoscyphus fraxineus* (also known as *Chalara fraxinea*), is the most significant tree disease to affect the UK since Dutch elm disease, which was first recognised in the 1960s. It is expected to lead to the decline and death of the majority of ash trees in Britain and has the potential to infect more than two billion ash trees (over 1.8 billion saplings and seedlings to more than 150 million mature trees) across the country.

European ash (*Fraxinus excelsior*) is the fourth most common tree species within Greater Manchester and so 7.9% of the total tree population is at risk (or 889,612 trees). Ash trees can be large in stature and provide a significant quantity of ecosystem services to Greater Manchester; their replacement should they perish would be costly (Figure 5).

**FIGURE 5: POTENTIAL REPLACEMENT COST OF PEST IMPACTS**



## GENERAL MORTALITY

Even as we are planting new trees, many of our trees are already nearing the end of their lives. The i-Tree survey found that 71.7% of the trees assessed in the Greater Manchester inventory are in either excellent or good condition, which means around 28% are less than good, either because they are old, or overcrowded, damaged or diseased. Trees in poor condition are less likely to thrive, so we can expect that we will lose many trees to poor condition over the lifetime of this strategy.

The woodland management guidance in [Section 4](#) provides the basis for an outline of what a joined-up Greater Manchester plan for helping to reduce the spread of disease should comprise – e.g. biosecurity (planting stock/tools and footwear), education, selective removal, restocking with more diverse and resilient species.

## CLIMATE CHANGE

Climate change is bringing both incremental changes and more frequent extreme weather events, both of which could have major impacts on our trees. Severe storms along with an increase in precipitation increases instability, causing more fallen limbs or entire trees. Although many trees are resilient to a certain degree of drought, any increases in temperature could make droughts more damaging to them. The summer of 2018 was exceptionally dry and resulted in the loss of many young trees. Climate change will also see likely increases of pests and diseases as the natural boundaries of pathogens shift.



## DEVELOPMENT

Greater Manchester is committed to growth and providing space for more homes and employment. This means developing some land that has previously been undeveloped or in the greenbelt. Approximately 460ha of woodland (some of which is also associated with one or other protective designation) and 366.5ha of trees outside woodlands<sup>48</sup> occur on land allocated for development in the GMSF – that equates to 17% of 4,792.5ha land allocations total – this doesn't include trees on sites being redeveloped as housing or office supply.

While our planners and development managers may require that trees removed through development are replaced, there is an inconsistency of approach across Greater Manchester, and we don't know how many trees are being lost.

It is important that developers minimise losses of mature trees and replace lost trees not simply in terms of numbers but in a way that reflects the initial tree value and benefit.

## MISTREATMENT OF URBAN TREES

Ongoing redevelopment of our urban landscape can threaten trees even when they're not being cut down. For example, where contractors digging in our roads and pavements dig through and damage roots of trees, or park heavy vehicles on roots. Also, trees may be considered a nuisance when residents come into conflict with the disbenefits of trees, such as:

- Branches overhanging boundaries
- Light reduction
- Leaf or fruit drop
- Ground-lifting by roots

This can result in residents removing trees, undertaking works themselves, or using uncertified contractors causing damage or killing trees.

A joined-up approach to dealing with this and educating residents would help prevent unnecessary tree loss or damage. We can already protect our trees using TPOs or conservation areas. A more consistent approach to using these mechanisms could help prevent loss of important trees.

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48 Greater Manchester Tree Audit 2010





## SECTION 3 –

# WHERE DO WE NEED MORE TREES?





### 3.1 BACKGROUND

We face urgent and significant environmental and social challenges in Greater Manchester, but we know that a healthy urban forest can be part of the solution, particularly where trees are incorporated into engineered solutions, as is the case for sustainable drainage systems.

Greater Manchester is committed to growth and providing space for more homes and employment, and finding space for more trees will become difficult. Also, funding for new planting is likely to remain a challenge. The GMSF policy on trees and woodlands (GM-G7) recognises that we need to “*target tree-planting at the areas of greatest need where the Green Infrastructure benefits can be maximised, whilst avoiding the loss of, or harm to, other priority habitats*”.

The following sections present a series of maps that highlight opportunity areas for new tree planting where the most (multiple) needs for tree benefits can be met, and where individual tree benefits can be best provided, be that flood alleviation, air quality, enhancement of active travel routes, etc.

In producing these maps, we focused on those tree benefits that we think represent the most pressing needs for Greater Manchester and to reflect the GMCA aim to connect people with their environment, use green spaces to improve people’s health and wellbeing, and focus on disadvantaged areas. In a time when resources are limited these maps should be used to guide the prioritisation of future tree planting to make sure that we get the best return on our investment.

The final product of the exercise is a set of scalable maps of locations where constraints to planting are minimal, and where careful planting could assist in delivering one or other of the in-scope services that can also highlight and score locations where tree planting could deliver multiple benefits.

### 3.2 THE MAPS

It should be noted that identification of priority areas for new planting does not imply that permissions have been sought or agreed. Our intention is simply to highlight those areas where there is the greatest level of need for the specific benefits that additional trees could provide, and the physical possibility to plant trees. Any planting proposals would necessarily involve identifying and engaging the landowners, followed by site-based ground-truthing and planting design exercise to establish practical feasibility, and for consultation with local partners to ensure no conflict exists with other local priorities. Furthermore, the effective delivery of benefits by trees will depend on trees being planted well and established.

While we have presented illustrations of the final maps here, the complete suite of maps is most usefully viewed at [Mapping GM](https://mappinggm.org.uk/gmodin/?lyrs=v_cot_tree_planting_opportunity/os_maps/light/11/53.5069/-2.3201_blank)<sup>49</sup>. The online versions allow users to view maps zoomed in to precise locations to examine potential opportunities at the site level or zoomed out at the landscape scale, and to view either individual ecosystem service benefits, or the maximum opportunity score (benefits needs met) map.

49 [https://mappinggm.org.uk/gmodin/?lyrs=v\\_cot\\_tree\\_planting\\_opportunity/os\\_maps/light/11/53.5069/-2.3201\\_blank](https://mappinggm.org.uk/gmodin/?lyrs=v_cot_tree_planting_opportunity/os_maps/light/11/53.5069/-2.3201_blank)

### 3.3 METHODOLOGY

As a starting point, the method used detailed Ordnance Survey MasterMap data within a GIS to identify all parcels of land that could potentially be used to plant at least one tree. These parcels were then compared with a series of different spatial datasets that represent areas of greatest need for one of the six environmental benefit types:

- Air quality
- Climate regulation – urban cooling
- Enhancing wildlife and habitat
- Improved health outcomes
- Improving place
- Water quality and flood management

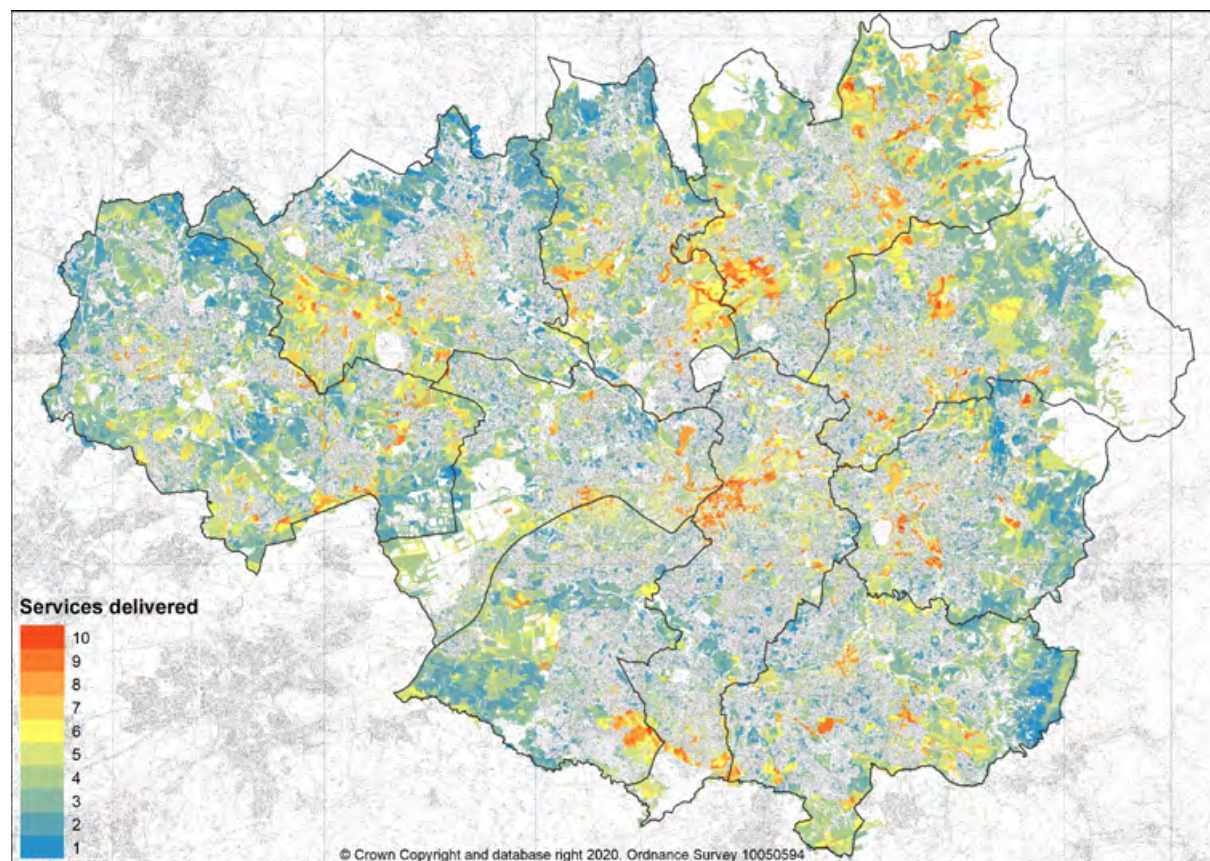
Parcels of land were scored between 0–2 to indicate the potential opportunity for planting at that location to deliver those benefits and contribute to reduction in impact of a specific environmental or social pressure, e.g. wide pavements present opportunity to help reduce exposure to NO<sub>x</sub>, large parcels of land on steep slopes present opportunity to establish catchment woodlands to slow overland flow and reduce particulate transport into headwaters.

A final prioritised planting map was produced by adding together the scores for each parcel, to identify where planting trees could deliver the greatest number of benefits.

Not all the benefits we get from trees' benefits mapped, e.g. CO<sub>2</sub>, since there is no spatial variation in need for that benefit. Once emitted, CO<sub>2</sub> mixes with the rest of the atmosphere, so it doesn't matter where we remove it from.

#### MAP 3: MAXIMUM OPPORTUNITY MAP

Opportunity scores for each parcel of land are summed to highlight those parcels where tree planting could respond to the greatest need for tree benefits.





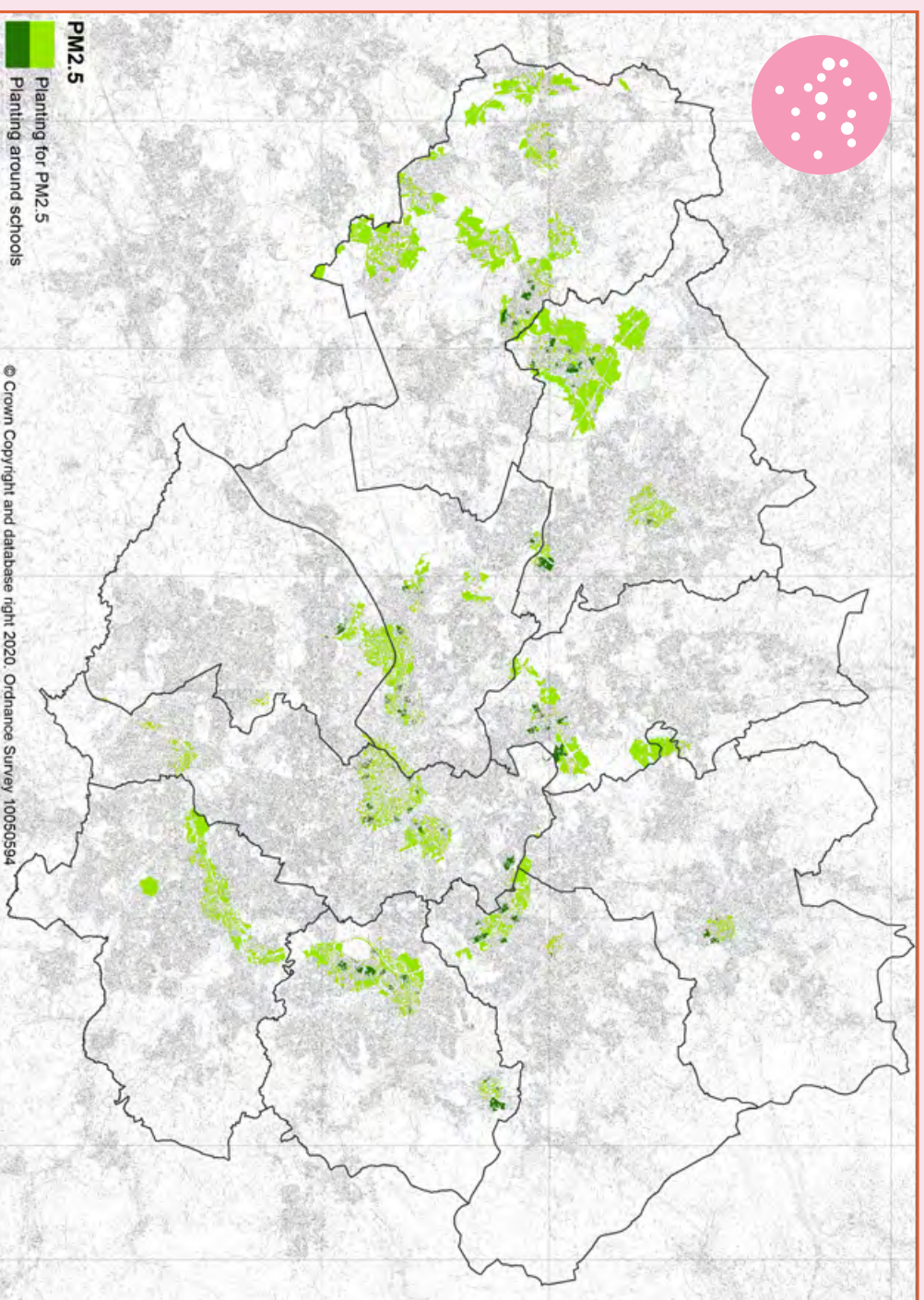
## SECTION 3 – WHERE DO WE NEED MORE TREES?

The needs that have been mapped where tree planting could provide benefit are as follows:

### AIR QUALITY

#### MAP 4: PARTICULATE MATTER

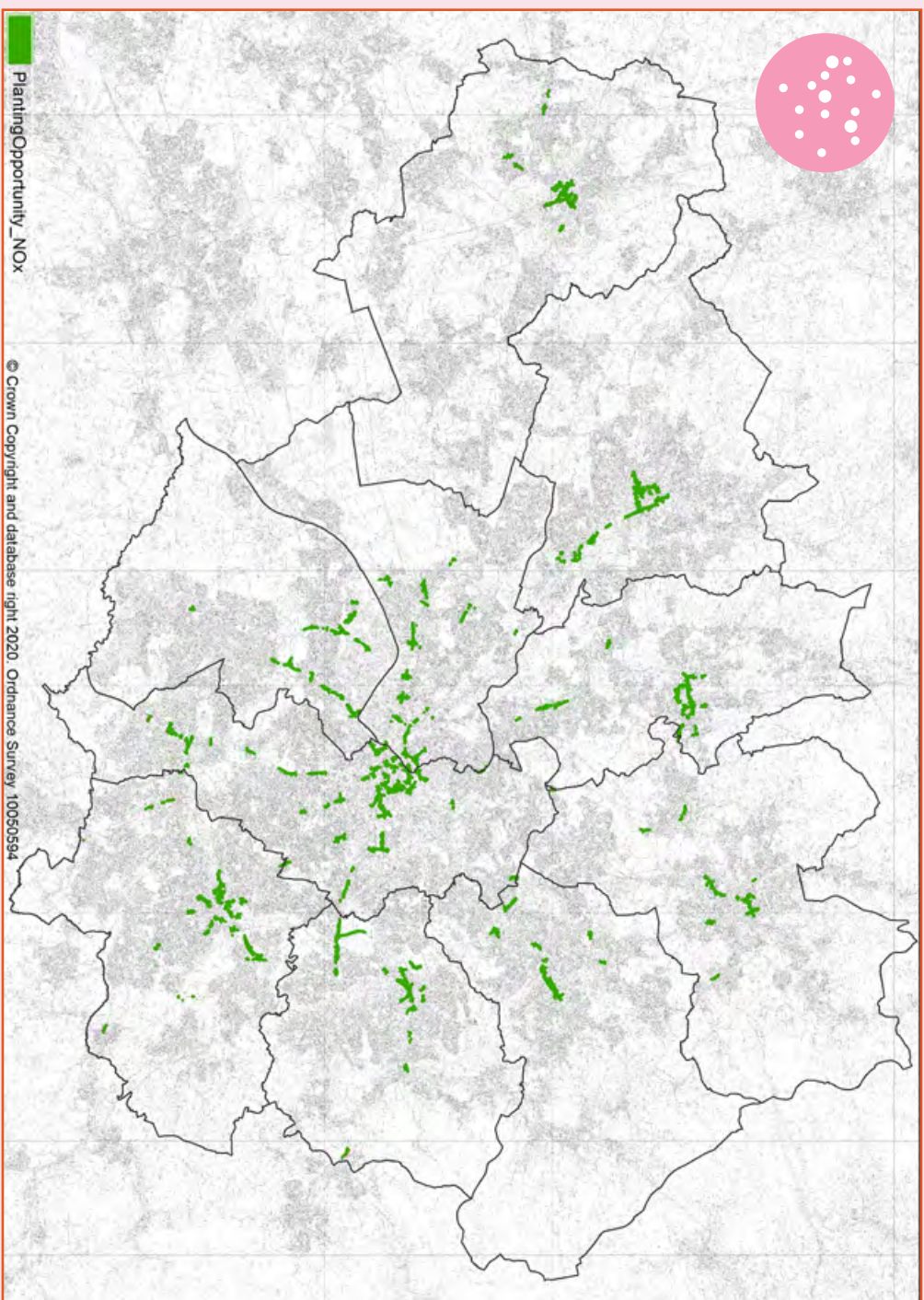
Although annual mean exposure rates for PM<sub>2.5</sub> are within UK legal limits, particulates from exhausts are exceeding World Health Organisation safety guidelines (10µg) and contributing to respiratory issues in several areas across Greater Manchester. Planting trees and hedges in areas with highest particulates (PM<sub>2.5</sub>) will help to reduce the particulate loading in the air and carefully designed planting could reduce exposure to harmful pollutants. Plantable locations close to schools have been given a higher weighting to reflect the higher priority of protecting children from poor air quality.





#### MAP 5: NOx

Exposure to oxides of nitrogen in Greater Manchester's atmosphere is expected to exceed legal levels in several locations by 2021. Roadside planting of trees/hedges can help intercept exhaust emissions, encourage dispersal, increase effective distance between source and receptor, and reduce exposure to pollutants. (Emerging work by the University of Birmingham – GI4RAQ – will provide increased certainty on location selection.<sup>50</sup>)

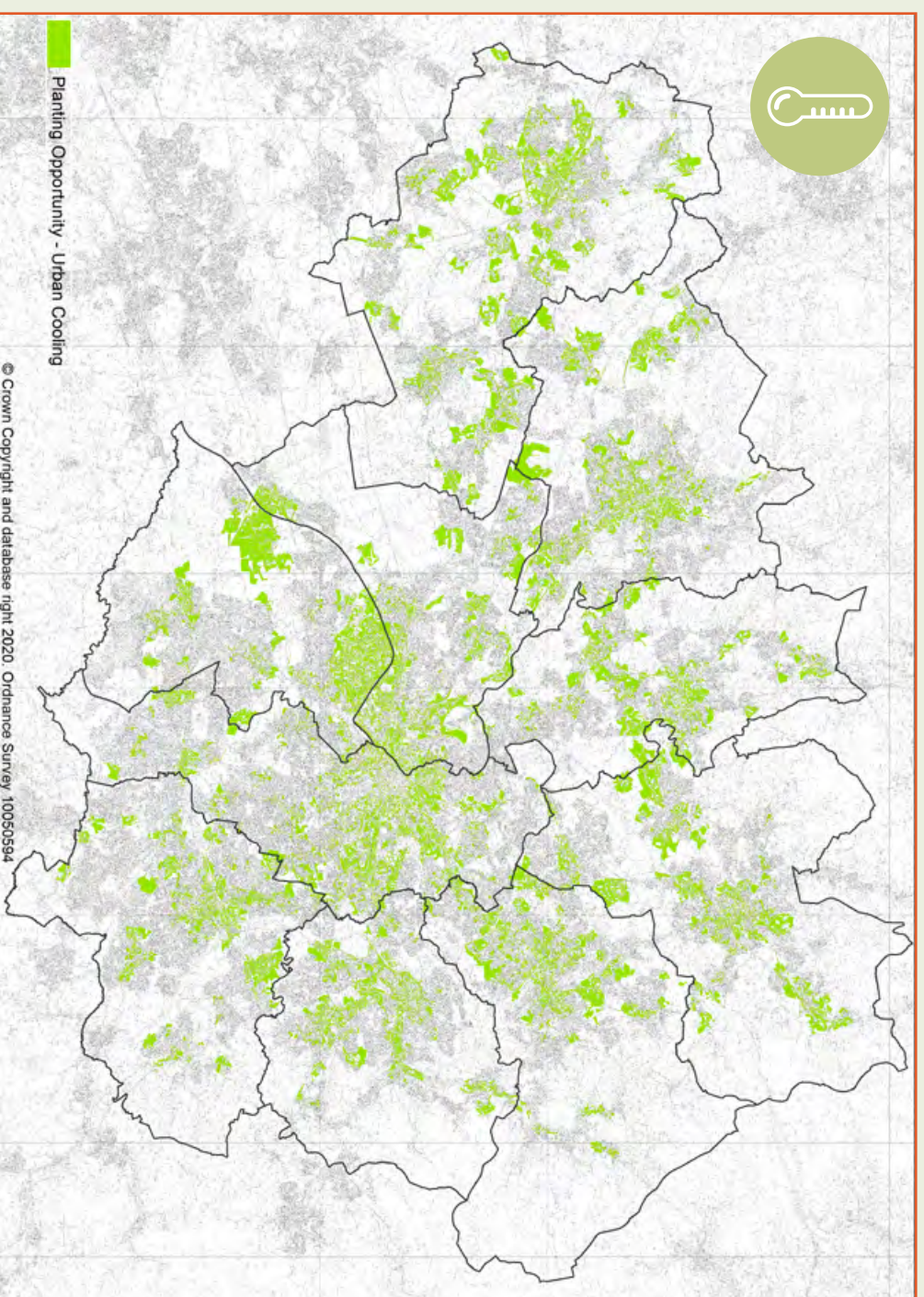


50 <https://www.london.gov.uk/WHAT-WE-DO/environment/environment-publications/using-green-infrastructure-protect-people-air-pollution>

## CLIMATE REGULATION

### MAP 6: COOLING

Summertime temperatures are expected to rise in the coming years, resulting in heat stress and increased mortality among vulnerable groups. The most susceptible areas are those with the lowest proportions of natural surface, where there are the highest densities of people living and working. Planting trees, particularly into hard surfaces, provides additional shade and cooling and can reduce temperatures.

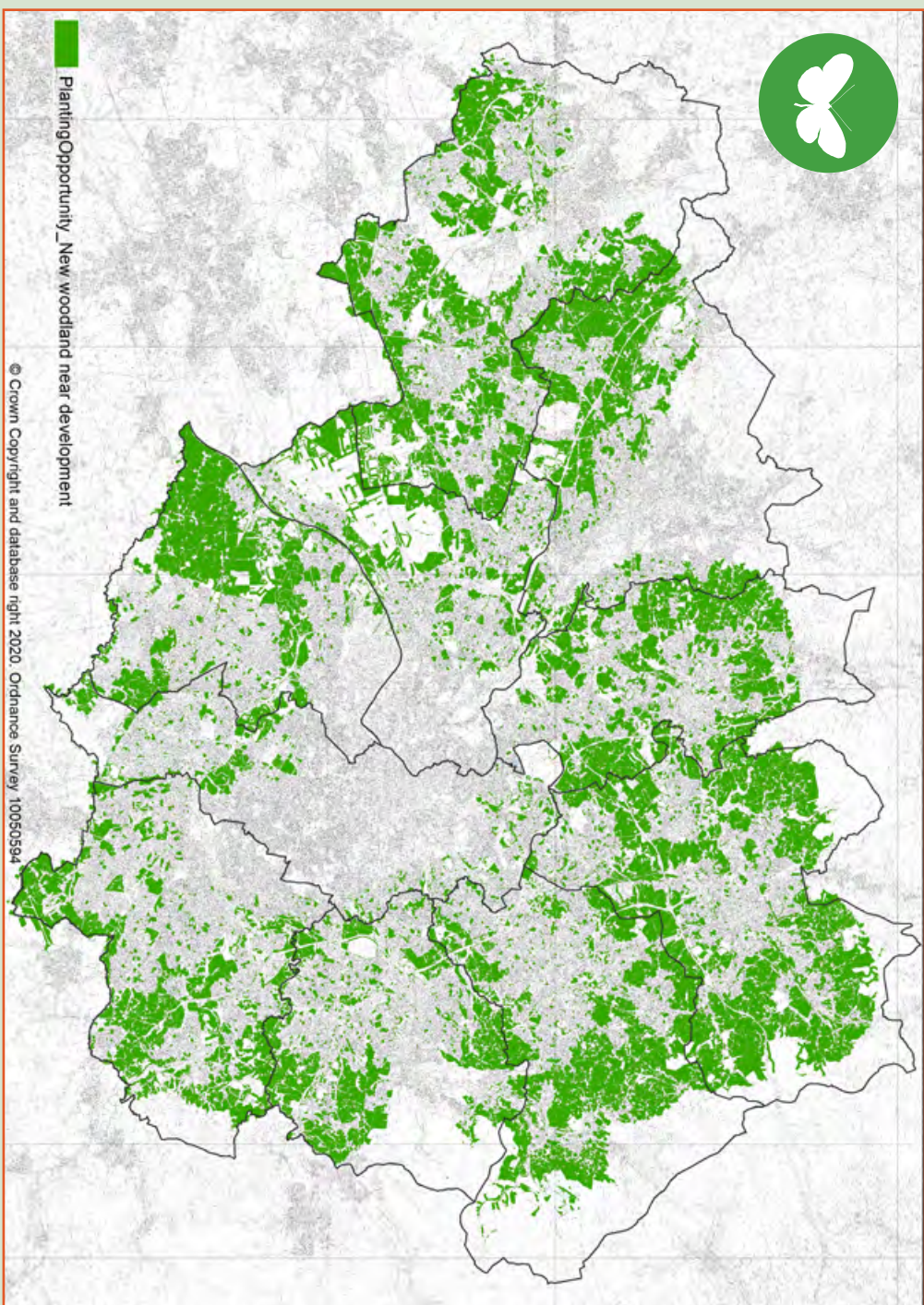




## ENHANCING WILDLIFE AND HABITAT

### MAP 7: NEW DEVELOPMENT

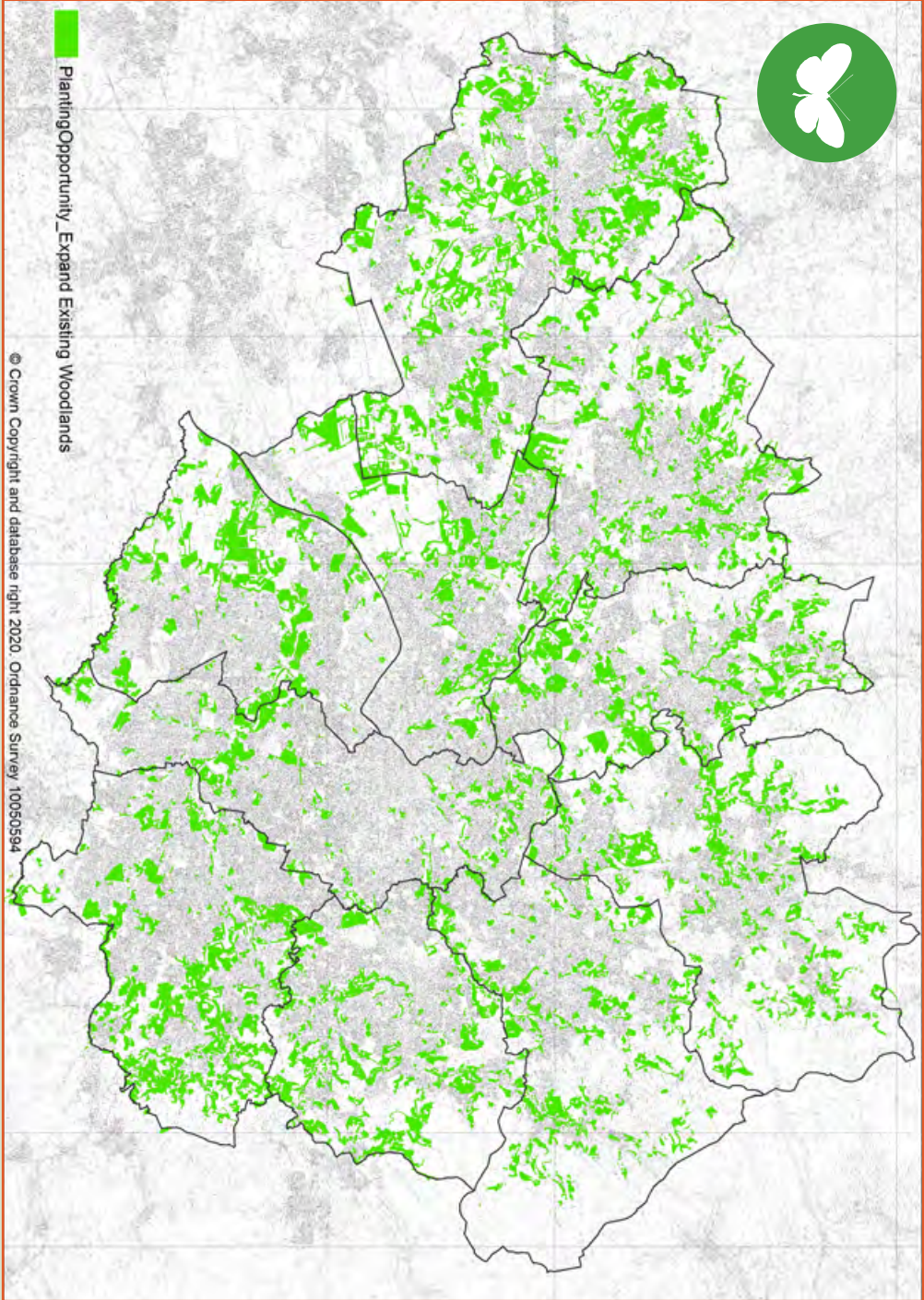
New planting sites within and close to development sites to realise gain in biodiversity from development, offset loss of biodiversity from development and attract funding for delivery and attract volunteers.





MAP 8: EXPAND WOODLAND

Expand existing woodland sites, reducing edge effects. This helps to reduce the impacts on species as a result in abrupt changes in habitat type.



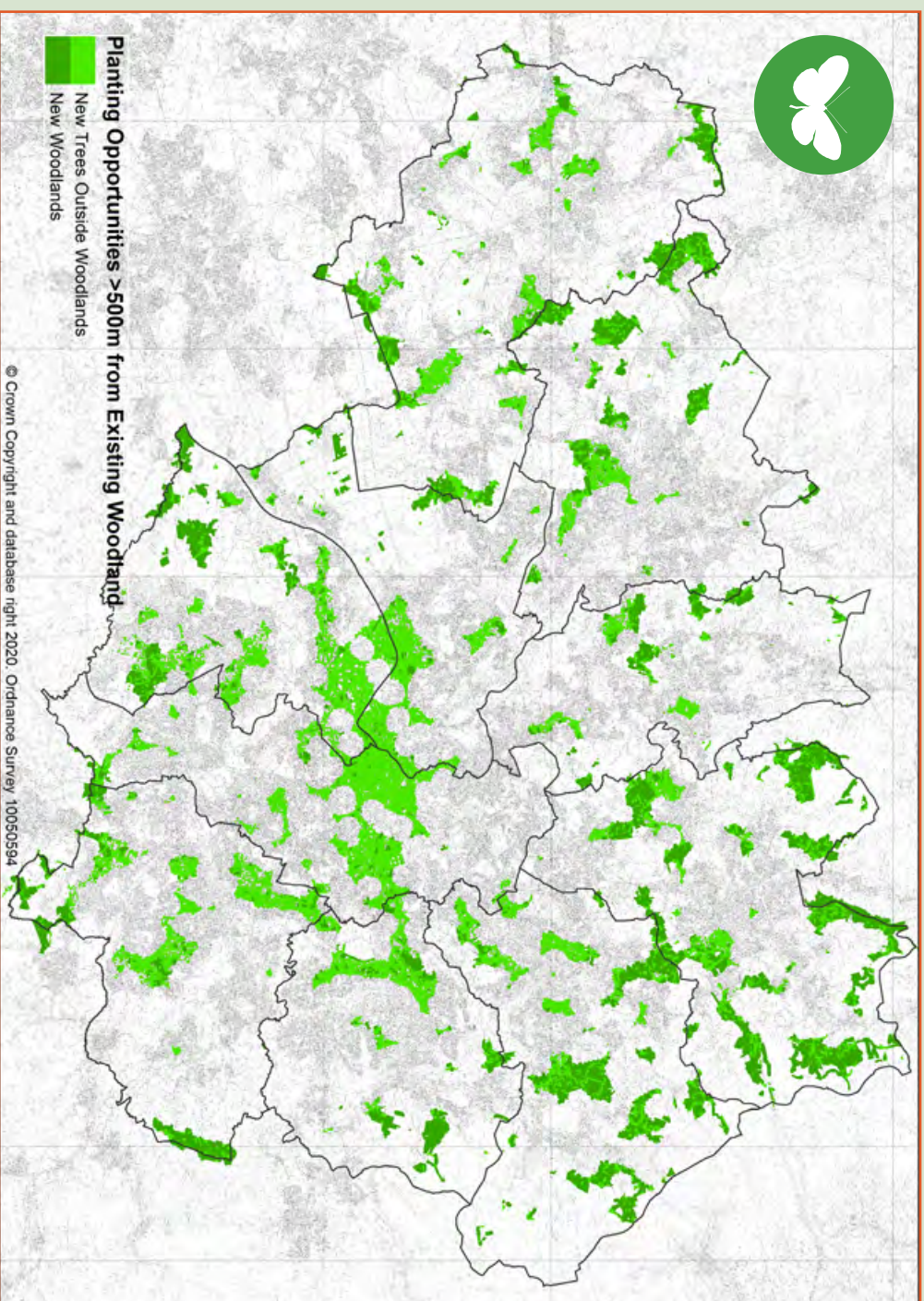
PlantingOpportunity\_Expand Existing Woodlands

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## MAP 9: RECOVERY NETWORKS

To deliver on the Lawton recommendations<sup>51</sup> and more effectively link protected sites and landscapes, as well as urban green and blue infrastructure. New woodlands and trees outside woodlands can help reduce worst impacts of habitat fragmentation and build Nature Recovery Networks. Research suggests that 500m is the maximum indicative distance for locating new native woods in relation to existing native woods to encourage colonisation by woodland species.<sup>52</sup> Scattered trees outside woodlands, such as street trees, can also provide valuable stepping stones and support movement of species between fragmented habitat – plantable parcels beyond 500m of existing woodlands represent critically important opportunities to create linkages in the woodland habitat network.



<sup>51</sup> Lawton 25 Env white paper/YEP

<sup>52</sup> <https://scotland.forestry.gov.uk/images/corporate/pdf/freshabitatnetworkguidance.pdf>

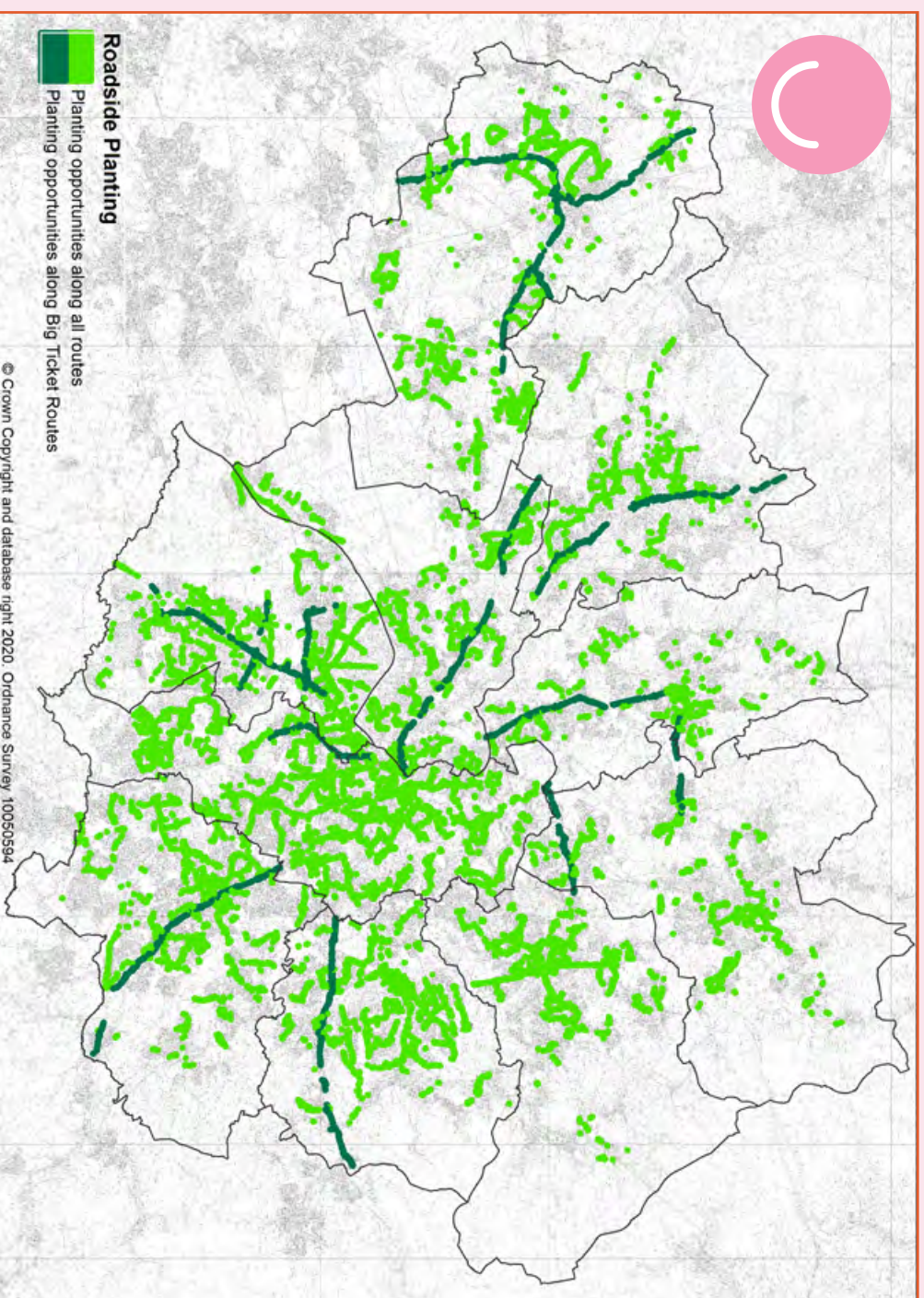


## IMPROVED HEALTH OUTCOMES

### MAP 10: ACTIVE TRAVEL

Tree planting can enhance hard routes, mark segregation, alter driver behaviour – TfGM's Bee Network delineates routes either used commonly by cyclists or pedestrians to travel around Greater Manchester, or with potential to be developed as such.

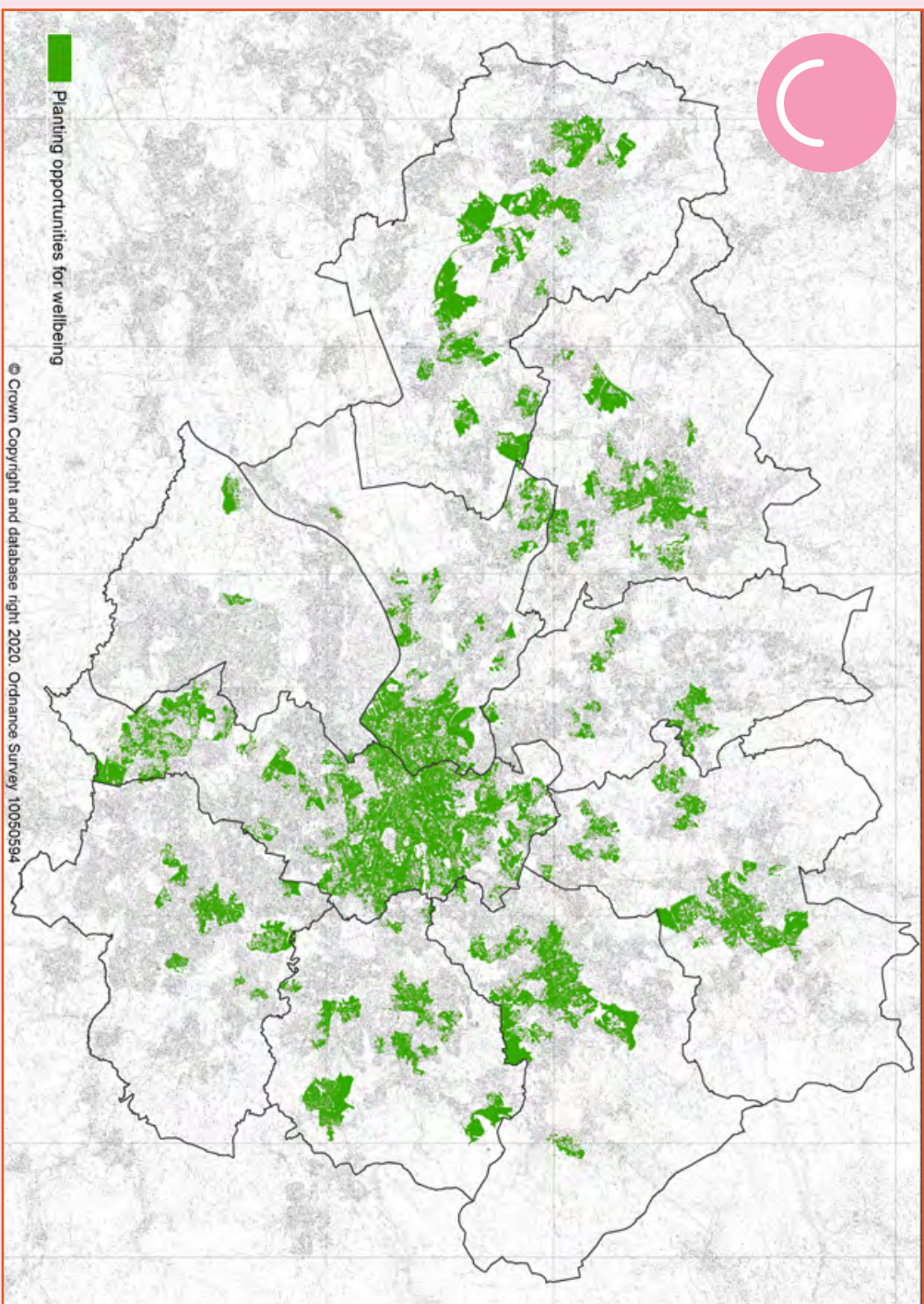
Big Ticket Routes identify those key corridors or crossing points on busier roads that will require a higher level of design intervention to improve cycling and walking. These then present opportunities for incorporating sensitive planting to enhance the routes, making them more attractive as active travel corridors.





#### MAP 11: MENTAL WELLBEING

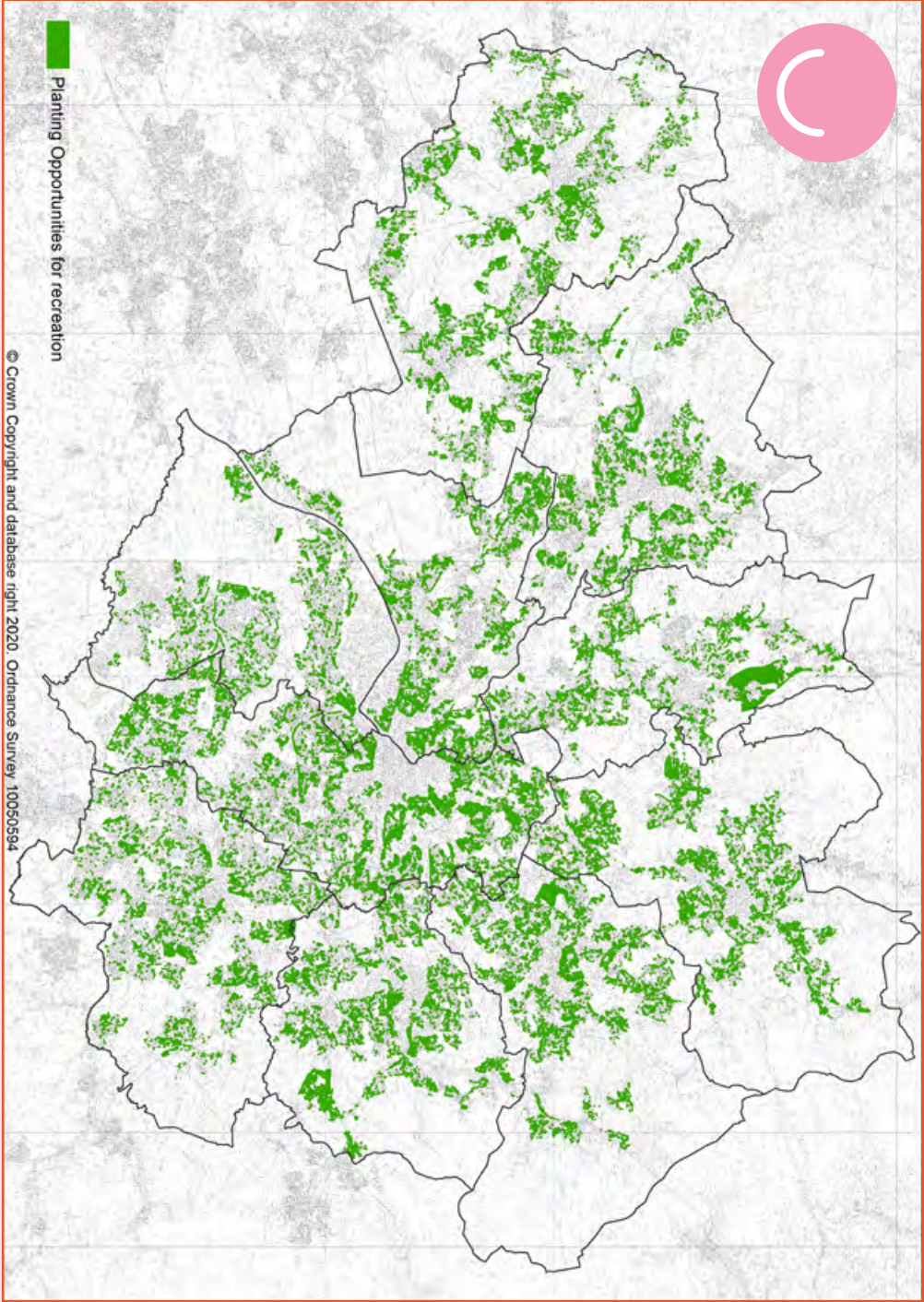
Having access to greener streets and wooded areas to walk or engage in nature-based community activities can help relieve stress and anxiety, recovery from illness, and promote wellbeing. Whilst many complicated factors determine a person's mental wellbeing, low income, low educational attainment and prevalence of long-term health problems are known indicators. The English Indices of Multiple Deprivation provide a rating for each neighbourhood based on income, education, employment and health.





MAP 12: RECREATION/PHYSICAL  
ACTIVITY

Where residential properties are located near informal leisure and recreation opportunities (greenspace and woodland) the greater the opportunities for local residents to be engaged in leisure and recreation, and derive the associated benefits for physical and mental health, as well as wellbeing. **ANGST**<sup>53</sup> standards specify that people should have access to greenspace within 300m of their homes.



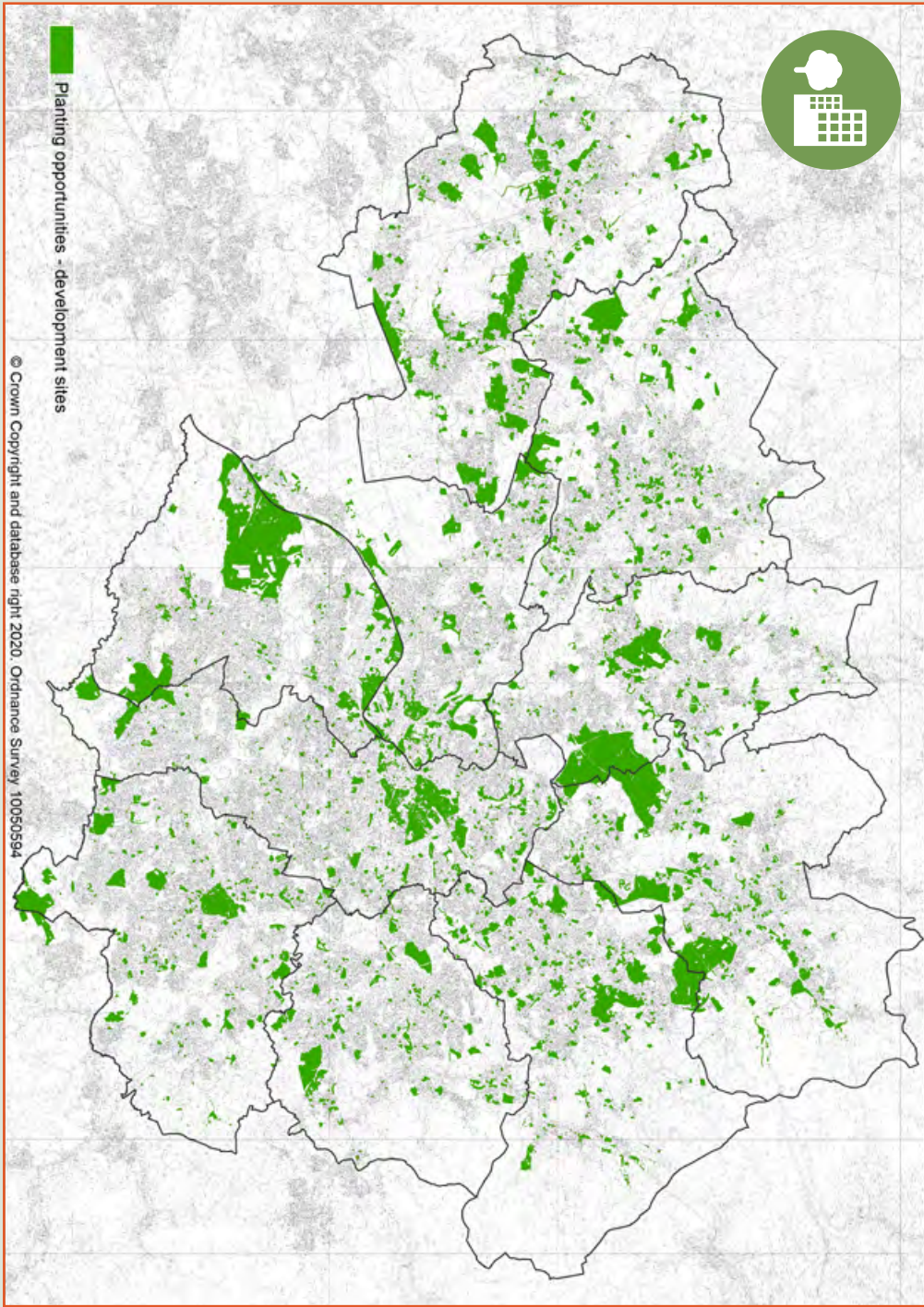
53 [http://www.ukmaburbanforum.co.uk/documents/other/nature\\_nearby.pdf](http://www.ukmaburbanforum.co.uk/documents/other/nature_nearby.pdf)



# IMPROVING PLACE

## MAP 13: DEVELOPMENT

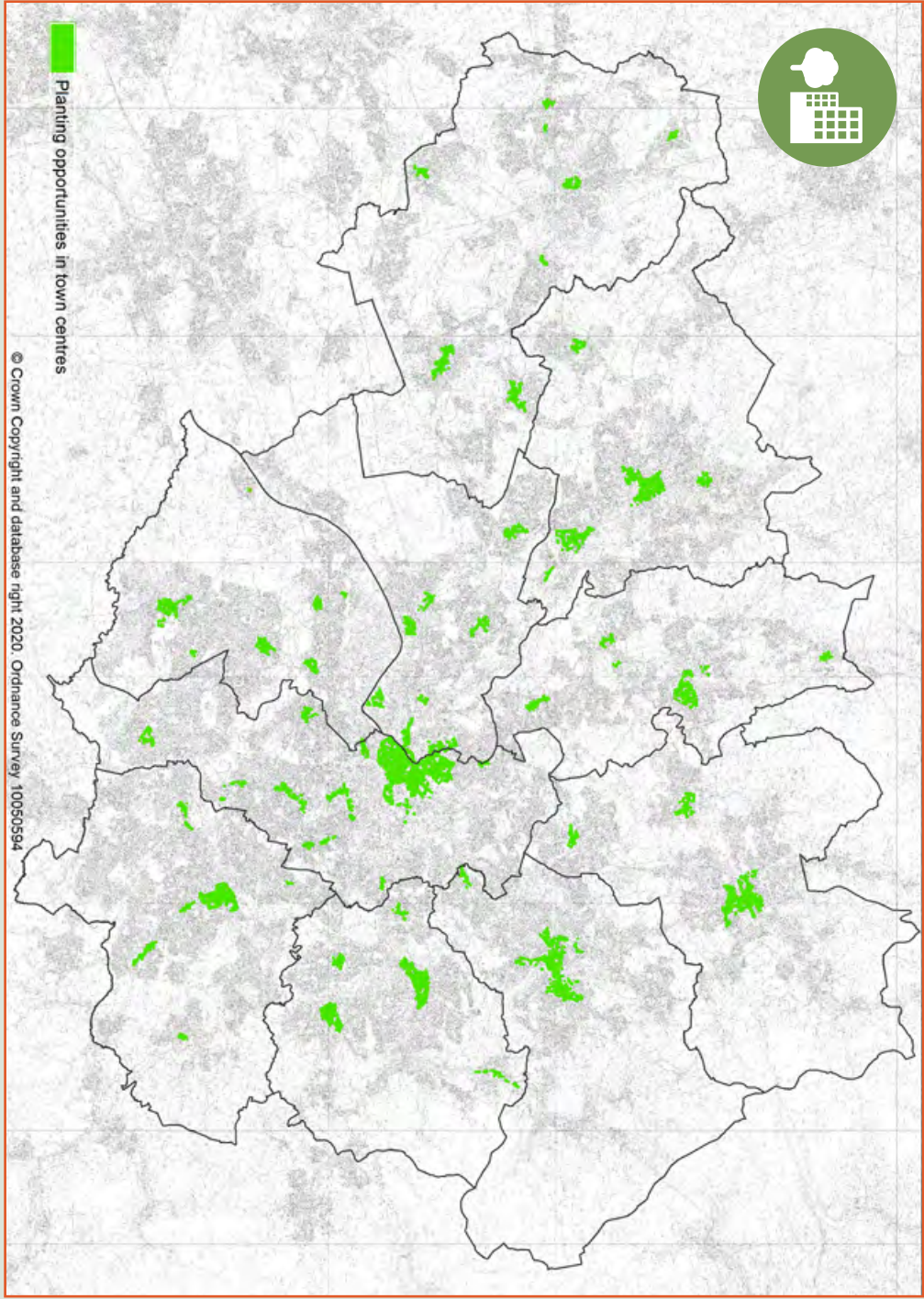
The GMSF sets out land across Greater Manchester that has been identified as suitable for new development or redevelopment to supply housing or employment sites. Incorporating tree planting should be made priority from outset of any development.





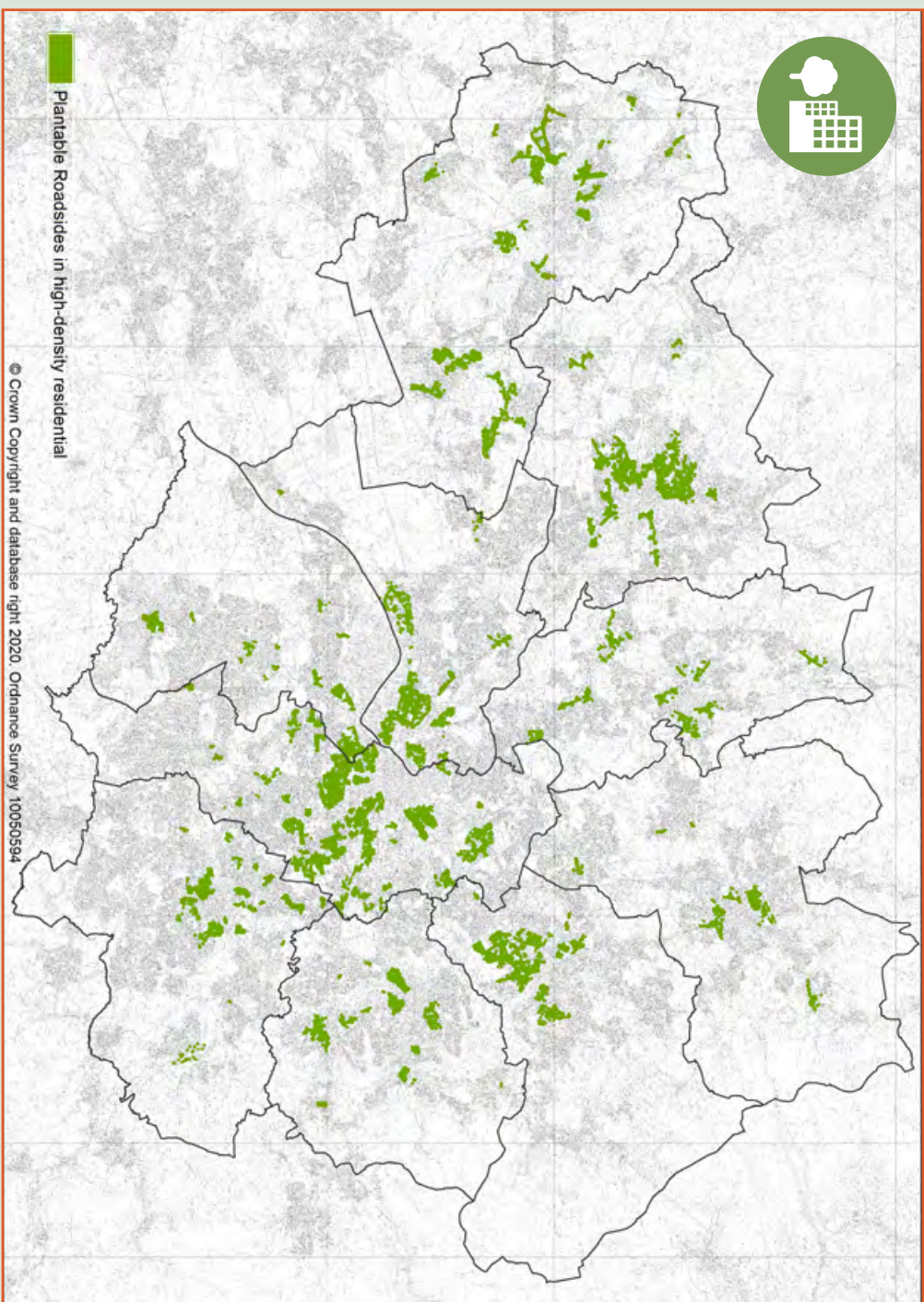
MAP 14: RETAIL

Tree-lined streets are more attractive to potential shoppers and result in a 'linger longer' effect.<sup>54</sup>



## MAP 15: NEIGHBOURHOODS

Tree-lined residential streets create more desirable, sustainable neighbourhoods.

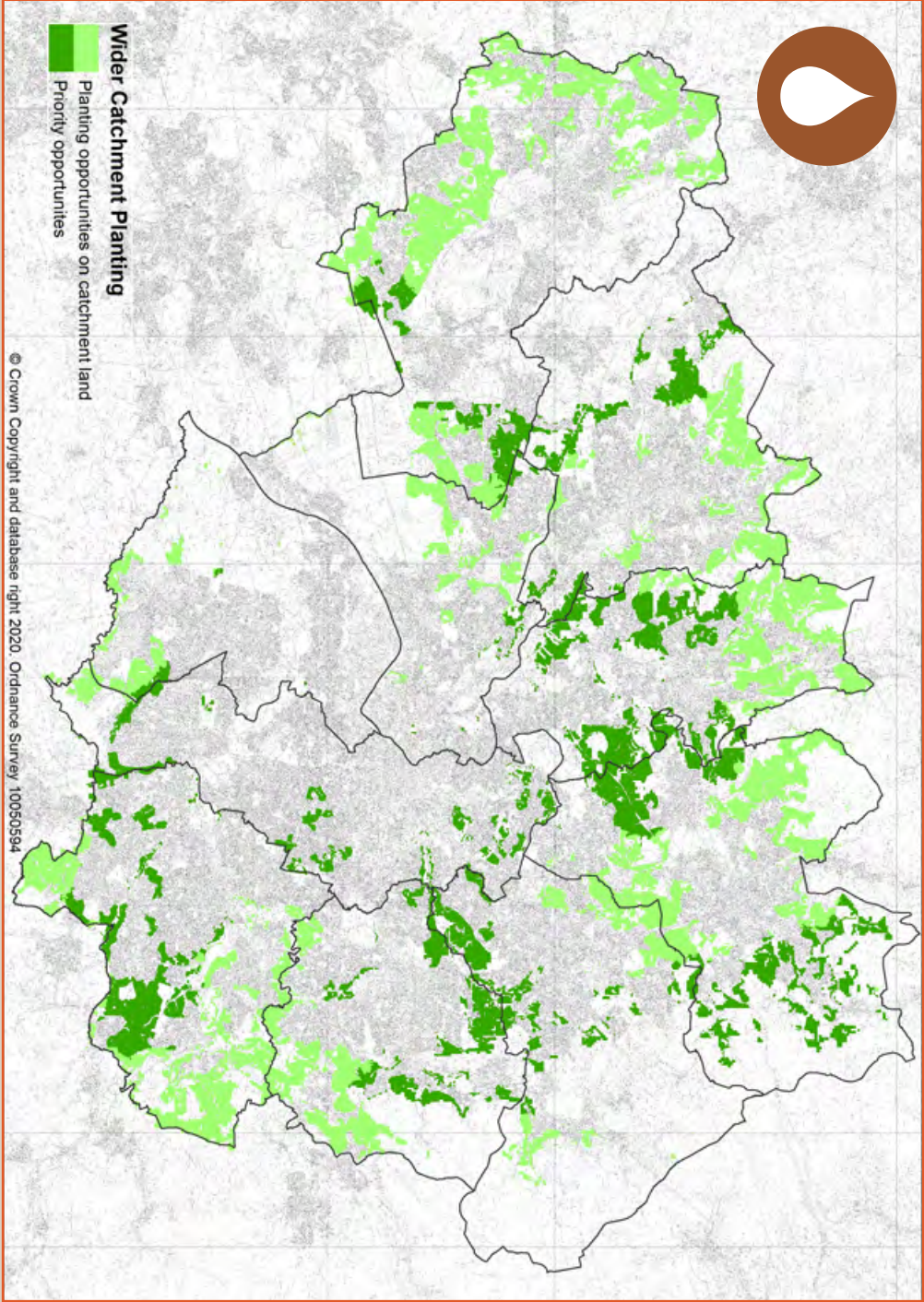




WATER QUALITY AND  
FLOOD MANAGEMENT

MAP 16: CATCHMENT PLANTING

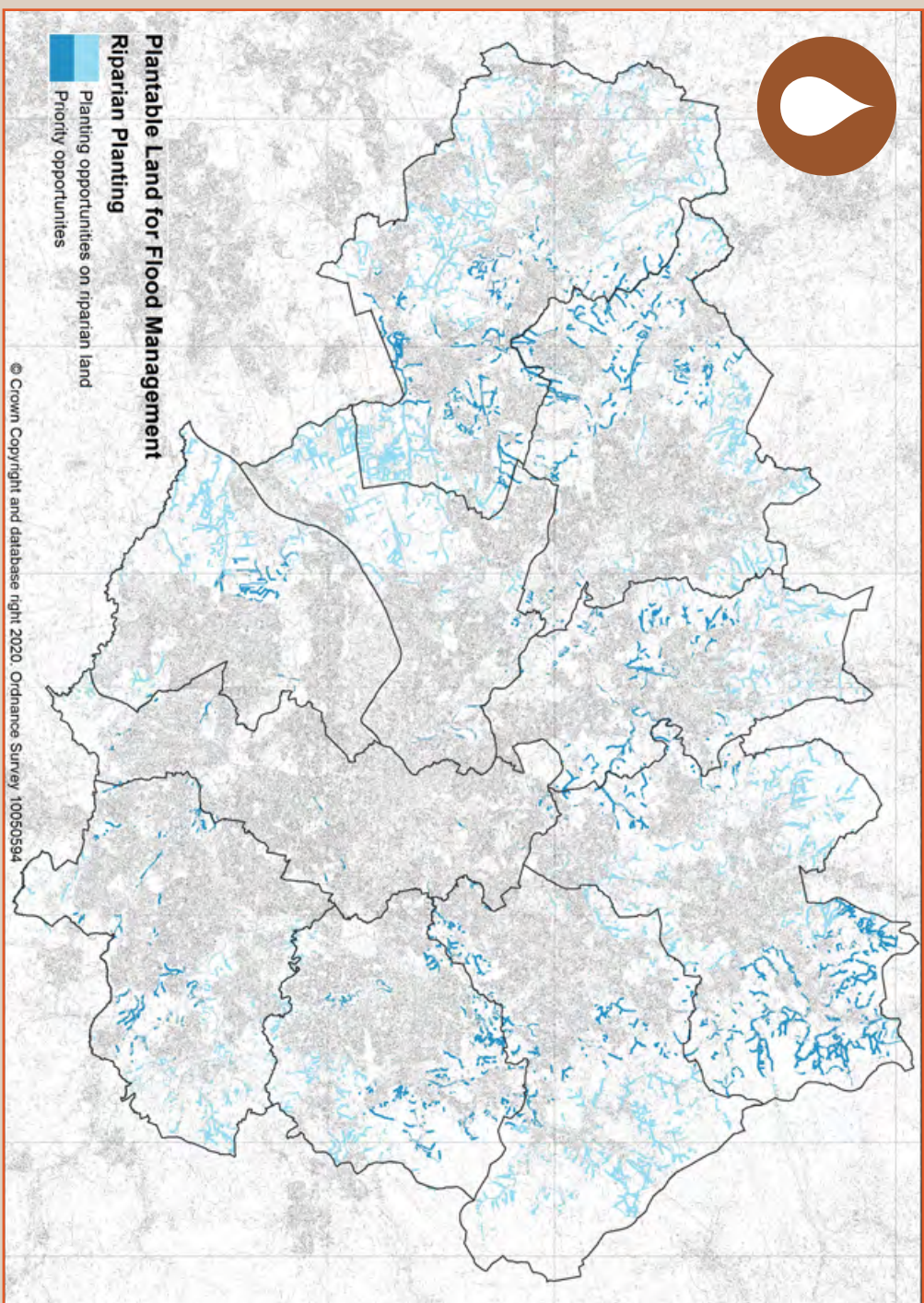
Slowly permeable soils where woodland could break up naturally impermeable soils and reduce surface runoff. Priority is given to parcels upstream of communities identified as at risk of flooding, where tree planting could significantly meet this need.





## MAP 17: RIPARIAN PLANTING

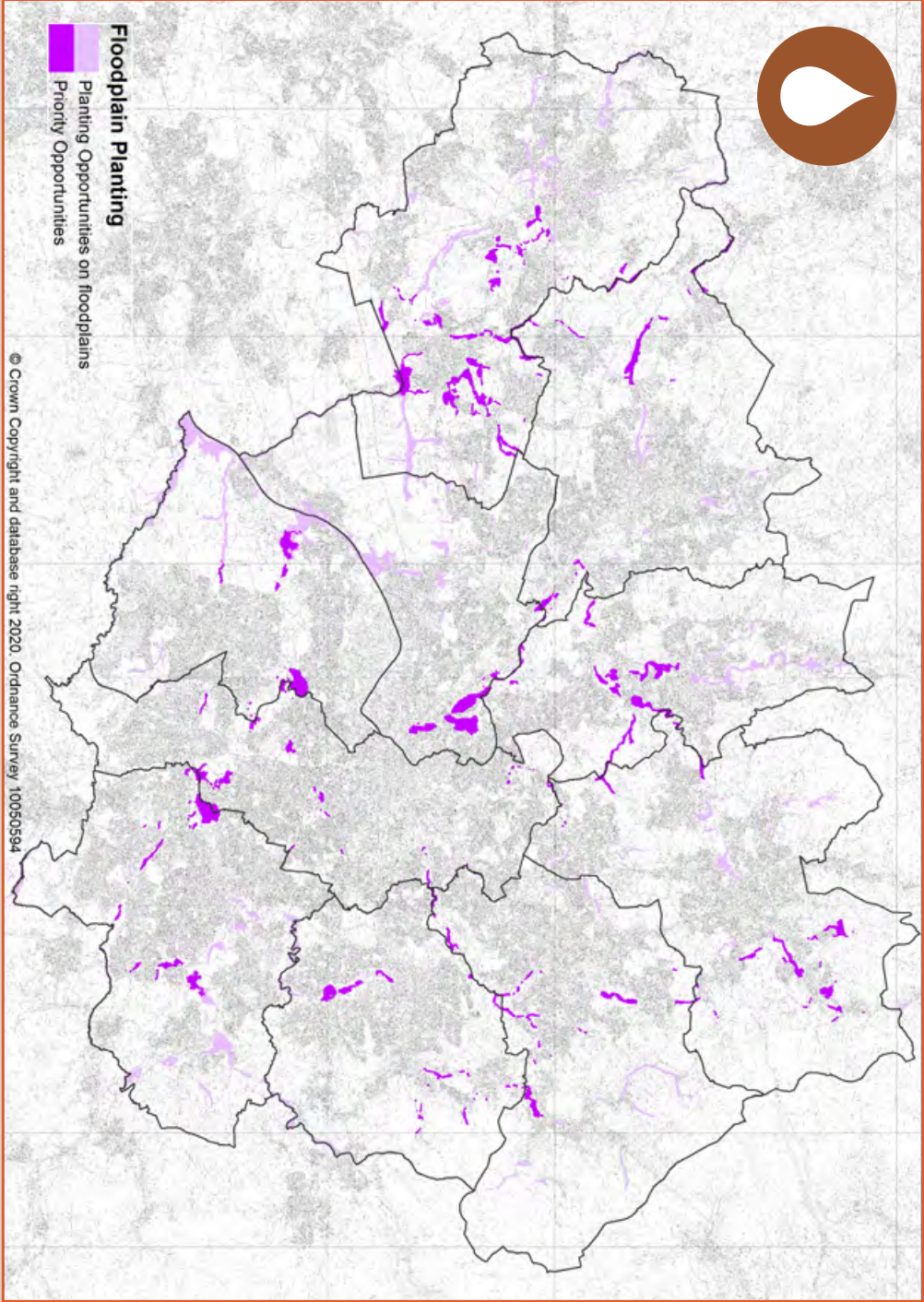
The main role of riparian woodland from a Natural Flood Management (NFM) perspective is to slow down and hold back flood flows within watercourses, as well as to reduce sediment delivery and bankside erosion. This draws on the higher hydraulic roughness presented by riparian woodland in the form of trees, shrubs and deadwood, including associated large woody structures within water channels, which deflect and encourage out-of-bank flows. Priority is given to parcels upstream of communities identified as at risk of flooding, where tree planting could significantly meet this need.





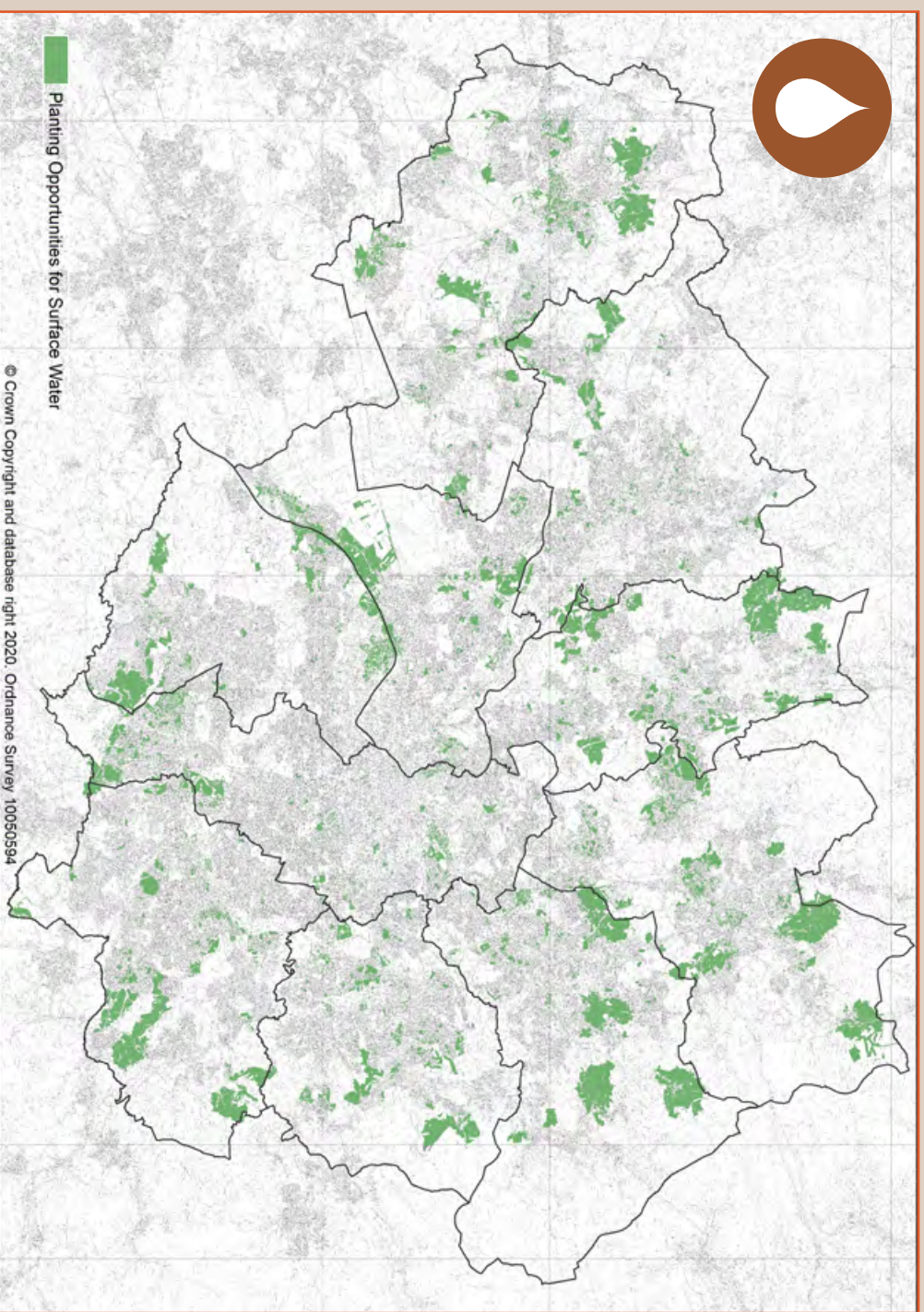
MAP 18: FLOODPLAIN PLANTING

The main role of floodplain woodland from a NFM perspective is to slow down and hold back flood flows within the floodplain, as well as to enhance sediment deposition and thereby reduce downstream siltation. Priority is given to parcels upstream of communities identified as at risk of flooding, where tree planting could significantly meet this need.



## MAP 19: SURFACE WATER

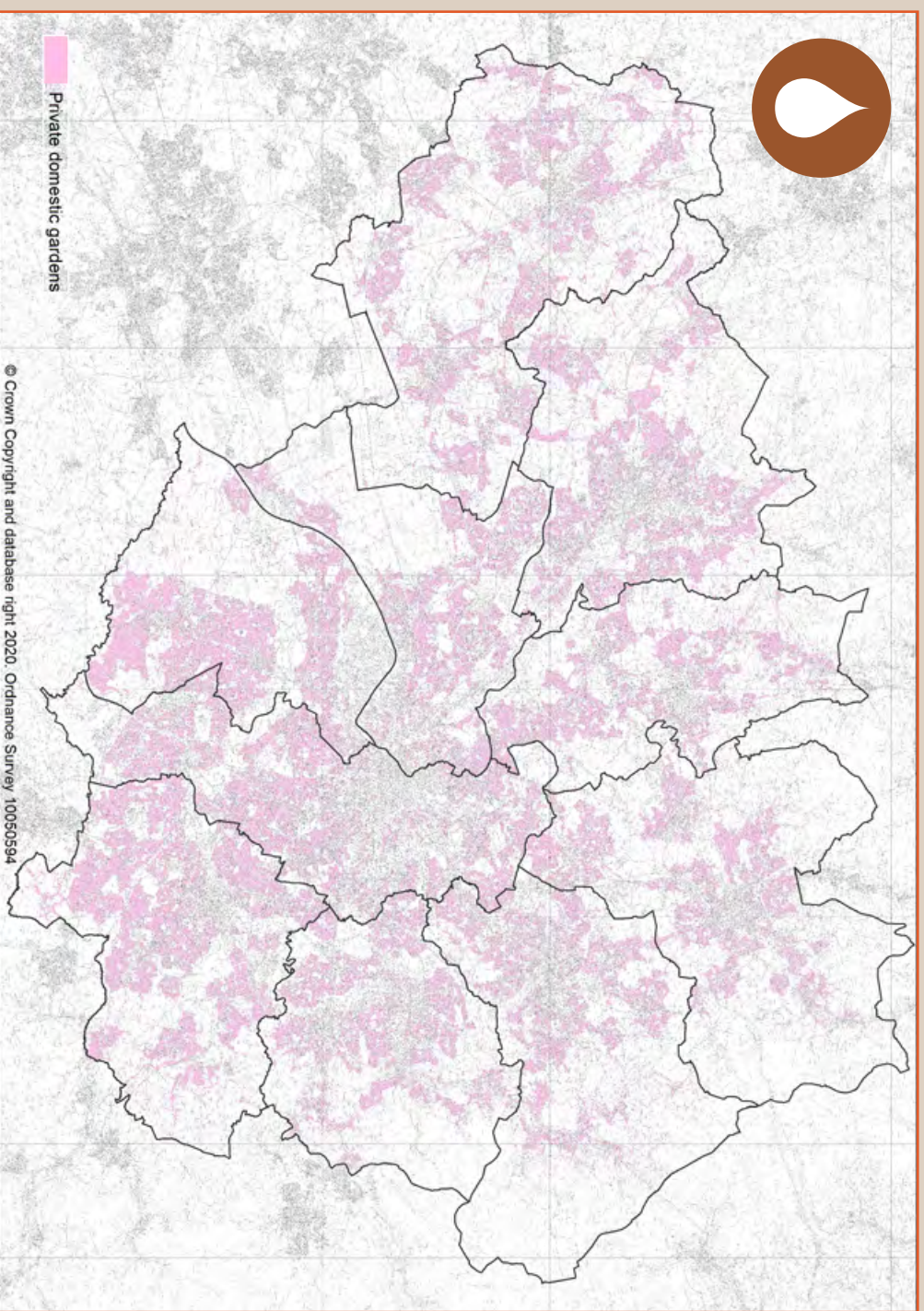
Surface water flood risk is widespread in the city, but catchments tend to be small so scope exists for local tree planting in soft and hard landscapes to intercept rainwater and reduce likely impact of surface water flooding, particularly if linked to Sustainable Urban Drainage Systems (SUDS). Frequency and severity of hydraulic failures of the sewer network, resulting in sewer flooding, could be greatly reduced if surface water can be intercepted above ground.





### MAP 20: PRIVATE GARDENS

These spaces make up 22,276.6ha 17% of Greater Manchester total area (127,640.9ha) and so present a unique opportunity for engaging residents on projects involving continued management of greenspace (as opposed to paving), planting additional trees, and good management of existing trees. These have been included to illustrate the scale of opportunity for further enhancement of the urban forest.







## SECTION 4 – GUIDANCE AND STANDARDS – GETTING MORE FROM OUR TREES



The guidance presented in the following section describes minimum legal requirements and strongly recommended guidance for managing our existing trees and woodlands, and for planting new trees. This is to ensure continued good health of the trees, minimise disruption to surrounding infrastructure, and to maximise benefits for the people and economy of Greater Manchester.

#### 4.1 HOW WE MANAGE OUR EXISTING TREE STOCK

Woodlands require management in order to deliver the many benefits we expect of them. Sustainable woodland management can be described as managing our woods in a way that meets our current needs but still maintains the same benefits and opportunities for future generations.

The relatively small amount of woodland cover we have in the UK today, and its fragmentary nature, means that this is not vast enough to function as true wildwoods. Even our oldest woodlands in England have been managed in the past with many plants and animals adapting and relying upon a more managed environment. All our woods have been influenced by people at some stage. Management gives an opportunity to improve their condition and help prepare them for an increasingly unsettled environment and climate.

#### WOODLAND-RELATED LAWS, REGULATIONS AND PROTECTION

Trees, woodlands and associated biodiversity are offered various protections and controls through numerous acts, laws and regulations. The woodland manager must consider and take account of these when planning and implementing woodland operations. The [UK Forest Standard](#)<sup>55</sup> sets out 'Requirements', which are then split into 'legal' and 'good forestry practice' requirements.

A useful overview of tree felling regulations and legislation can be found on this [government website](#)<sup>56</sup>

#### TREE FELLING CONTROLS AND PROTECTION

**Felling Licence** – permission is needed from the Forestry Commission if tree felling exceeds timber volume and time thresholds.

**Tree Preservation Orders (TPOs)** – trees that are protected by TPOs require permission from the local planning authority for work on them.

**Conservation areas** – notice needs to be given to the local planning authority prior to work on trees in these areas.

**Protected species** – trees may host nesting birds or European Protected Species such as bats and this may restrict work on trees.

<sup>55</sup> <https://www.gov.uk/government/publications/the-uk-forestry-standard>

<sup>56</sup> <https://www.gov.uk/government/publications/the-uk-forestry-standard>

## FELLING LICENCES

For thinning and felling operations within woodlands, a felling licence is required by law if certain thresholds are exceeded. A felling licence application is submitted to the Forestry Commission and is assessed against the UK Forestry Standard (UKFS). Any woodland felling carried out without a licence is an offence unless it is covered by an exemption. This can mean on conviction, a fine up to £2,500 or twice the value of the trees, whichever is higher. In addition, a Restocking Notice may be served to replant trees on the land concerned, or any other land as may be agreed. These Notices stipulate that the replacement trees must be maintained to an acceptable standard for up to 10 years. Full details of the exemptions and procedure for obtaining a felling licence can be found in Forestry Commission publication ‘[Tree Felling, Getting Permission](#)’.<sup>57</sup>

## HEALTH AND SAFETY IN RELATION TO TREE SAFETY

A landowner (or person accountable for a tree) is responsible for the health and safety of those on or near the land where a tree stands and has potential liabilities arising from the falling of a branch or tree. This falls within the Occupiers’ Liability Acts of 1957 and 1984. Landowners need to consider the risks posed by their trees and plan systems of inspection with reference to any risk management process. A tree safety strategy, guides management decisions and practice in a reasonable and cost-effective way by addressing: zoning, tree inspection and managing risk at an acceptable level. For more information on the responsibilities of landowners regarding the health and safety of their trees can be found in the National Tree Safety Group publication [Common sense risk management of trees](#).<sup>58</sup>

## TREE PRESERVATION ORDERS

Tree Preservation Orders (TPOs) are made by a local planning authority (LPA) to protect specific trees, groups of trees or woodlands. A TPO makes it a criminal offence to cut down, top, lop, uproot or wilfully damage or destroy the tree protected without the LPA’s written consent. In serious instances, cases may be dealt with in the Crown Court where an unlimited fine can be imposed. More information on TPOs can be found on this [government website](#)<sup>59</sup> and within the LPA’s own website. If you are unsure whether a tree is subject to a TPO, contact your local authority tree officer or person responsible for TPOs in the council.

## CONSERVATION AREAS

A conservation area is designated because of its special architectural or historic interest. Local planning authorities will need to be contacted in advance (six weeks’ notice) of any proposed work on a tree in a conservation area. During this notice, the LPA may consider issuing a Tree Preservation Order. There are a number of exemptions to the need to provide notice e.g. if the tree’s diameter is no greater than 75cm measured at 1.5m above ground level. Wilful damage or destruction of a tree without giving prior notice can result in a fine up to £20,000 per offence. More information can be found on this [government website](#)<sup>60</sup>.

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57 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/699991/treefellingaugust.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/699991/treefellingaugust.pdf)

58 <https://www.forestresearch.gov.uk/research/common-sense-risk-management-of-trees>

59 <https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas>

60 <https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas>





## RESTRICTIVE COVENANTS

A restrictive covenant can be placed on land or property that could require the consent of a third party prior to undertaking tree work or removal of trees or hedges. This legal promise is bound to the land rather than to the property owner and continues even when the land or property is sold on.

## PUBLIC RIGHTS OF WAY

Where a hedge or tree overhangs or obstructs a public right of way, the local planning authority has a right to remove the obstructing material. The council also has the power to require the owner or occupier responsible for the hedge/trees to remove the overgrowth within a period of 14 days, after which works can be carried out and the costs recharged to the owner/occupier.

In England and Wales, highway authorities have a duty to maintain legally recognised maps of rights of way. Permission must be obtained from the local authority before gates or stiles are installed across public footpaths or bridleways. The landowner must maintain these in a safe condition.

## TREES AND THE PLANNING SYSTEM

Under the UK planning system, LPAs have a duty to consider the protection and planting of trees when granting planning permission for development. This consideration is irrespective of whether the trees are protected or not by a TPO or conservation area.

There is further guidance on the level and type of information required by an LPA to consider the effects of development proposals on trees within BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.

The Forestry Commission and Natural England have also produced guidance – [Ancient Woodland, ancient trees and veteran trees: protecting them from development](#).<sup>61</sup> This outlines what local planning authorities should consider for developments affecting Ancient Woodland, ancient trees and veteran trees. The Woodland Trust has also produced a guidance document [‘Planning for Ancient Woodland, Planners’ Manual for Ancient and Veteran Trees’](#).<sup>62</sup>

<sup>61</sup> <https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences>

<sup>62</sup> <https://www.woodlandtrust.org.uk/media/3731/planners-manual-for-ancient-woodland.pdf>

## TREES WITHIN A SITE OF BIOLOGICAL IMPORTANCE

The Greater Manchester Ecology Unit (GMEU) operates the Sites of Biological Importance (SBI) register for and on behalf of the 10 local authorities in Greater Manchester. SBIs are non-statutory areas of nature conservation. Many SBIs contain trees and areas of woodland. The SBI system is designed to establish and highlight to planners, landowners and site managers where areas of high biodiversity interest occur so that appropriate decisions on planning applications, land use and land management can be made.

## SITES OF SPECIAL SCIENTIFIC INTEREST (SSSIs)

SSSIs in England are designated by Natural England for areas that are of particular interest because of their fauna, flora or geological or physiological features. SSSIs can contain many different habitat types including woodland. Natural England's objective is to achieve 'favourable condition' status for all SSSIs. Favourable condition means that the SSSIs' habitats and features are in a healthy state and are being conserved by appropriate management. Land managers must check whether they need consent for certain operations or management – they will be expected to manage land within a SSSI effectively and appropriately to conserve the special features of the site. Natural England can provide some advice free of charge – additional advice can be purchased from them. More information on managing SSSI land can be found on this [government website](#).<sup>63</sup>

## WILDLIFE AND COUNTRYSIDE ACT 1981 (AND SUBSEQUENT AMENDMENTS)

Wild birds and certain woodland animals and plants are protected under Part 1 of this Act. It requires that the risks to wildlife from woodland operations are carefully assessed and that work is planned to ensure the animals listed are not intentionally harmed or killed and that their nests or dwellings are not damaged or destroyed. The Act makes it an offence (with various exceptions) to intentionally kill or injure any wild bird; take damage or destroy the nest of a wild bird; or take or destroy an egg of any wild bird. Unlimited fines and/or up to six months imprisonment can be imposed for criminal offences under the Act. Other wild animals that are protected that may be found in woodland include: bats and their roosts; certain butterflies; and red squirrels and their drays.

Wild plants listed in schedule 8 of this Act must not be intentionally uprooted or destroyed during forestry operations. Woodland plants include bluebell and juniper.

The presence of nesting birds can delay but not prevent the felling of trees, hedgerows and woodlands. Work to hedgerows, trees and woodlands can take place at any time of year, but the onus is on the person doing the work to avoid committing an offence under the Act.

A summary of the Act can be found on this [JNCC website](#)<sup>64</sup> along with links to legislation documentation.

## PROTECTION OF BADGERS ACT 1992

This Act restricts the killing, injuring or taking of badgers or interference with their setts. It is often possible to achieve this by following good practice when planning and undertaking forestry operations. In rare occasions where there is doubt over whether damage or disturbance to badgers would occur or where it is clear that damage or disturbance would be unavoidable, a license from Natural England may be required.

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<sup>63</sup> <http://www.legislation.gov.uk/ukpga/1981/69>

<sup>64</sup> <http://jncc.defra.gov.uk/page-1377>



There is guidance on the [government website](#)<sup>65</sup> which outlines what must be done to avoid harming badgers and when a licence is needed.

## ENVIRONMENTAL IMPACT ASSESSMENT (FORESTRY) (ENGLAND AND WALES) REGULATIONS 1999

The forestry operations of concern within the Regulations are:

- Afforestation
- Deforestation
- Forest roads
- Forest quarries

For each of these types of operations there is an area threshold. There are lower thresholds for operations that occur within more sensitive areas e.g. SSSI.

The Forestry Commission is responsible for administering the regulations. If landowners are undertaking work that could be classed as one of the above operations, they should notify or ask for their opinion depending on the scale of the operation. An Environmental Impact Assessment (EIA) enquiry form should be completed, and any other relevant information should be submitted to the Forestry Commission.

There is guidance on the [government website](#)<sup>66</sup> which outlines the assessments needed for woodland projects.

## CONSERVATION OF HABITATS AND SPECIES REGULATIONS (EUROPEAN PROTECTED SPECIES) 2017

Owing to rarity and vulnerability to habitat changes some plants and animals, and the key habitat that they rely upon, are protected by law.

These species are listed as ‘European Protected Species’ (EPS) under the Conservation of Habitats and Species Regulations 2017. They also receive additional protection under the Wildlife and Countryside Act 1981.

In England most are woodland species and include:

- All species of bat
- Great crested newt
- Dormouse
- Otter
- Smooth snake and sand lizard

There is plenty of guidance and information regarding best practice for these animals available from the [Forestry Commission](#)<sup>67</sup>. A [proforma checklist](#)<sup>68</sup> is available for use from the Forestry Commission when undertaking operations within woodland. In certain circumstances it may be difficult to adhere to best practice, in these instances a licence may need to be sought from Natural England/Forestry Commission.

<sup>65</sup> <https://www.gov.uk/guidance/badgers-protection-surveys-and-licences>

<sup>66</sup> <https://www.gov.uk/guidance/environmental-impact-assessments-for-woodland-overview>

<sup>67</sup> <https://www.gov.uk/guidance/manage-and-protect-woodland-wildlife>

<sup>68</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/697614/Site-feature-checklist.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/697614/Site-feature-checklist.pdf)

## PLANT HEALTH ACTS

Statutory orders made under the Plant Health Acts prevent the introduction and spread of forest pest and diseases and must be complied with. Suspected pest and diseases must be reported to the forestry authority if they are notifiable and access must be given to Plant Health Inspectors and their instructions must be followed.

An example of this are Plant Health orders placed on woodland that contains *Phytophthora ramorum* infected plant material. Typically these orders restrict the movement of plant material off site.

There is guidance on this [government website](#)<sup>69</sup> on plant health legislation for forestry aimed at Forestry Commission staff and inspectors who work in sector.

## SCHEDULED MONUMENTS

The statutory authority responsible for archaeology in England is Historic England. Consent is required from Historic England for any work on a scheduled monument site that has the potential to damage the monument.

There is guidance on scheduled monument consent on the [Historic England website](#).<sup>70</sup>

## ACCESS TO WOODLANDS

There is no general right of public access to woodland or forests in England and Wales. The Countryside and Rights of Way Act 2000 provides for public access on foot to land mapped as 'access land' by Natural England. The Act also allows for woodland to be voluntarily dedicated as access land in perpetuity.

There is further guidance on open access land, rights and responsibilities including dedicating land for access, on this [government website](#).<sup>71</sup>

## TREES AND ELECTRICITY LEGISLATION

Under the Electricity Act of 1989, the landowner where power lines are located is responsible for managing the trees and can reclaim these costs from the network operator. However, due to the dangerous nature of working near power lines, it is common for the operator to offer to undertake the necessary work on behalf of the landowner. If the landowner is unwilling to allow works to be undertaken, the operator has powers under schedule 4, paragraph 9 – 'Felling and lopping of trees etc', to give notice to the landowner requesting work be carried out and if needed undertake the tree work itself.

One of the exemptions to the felling licence requirements includes felling trees essential to maintain electricity services. However, any tree felling beyond the minimum clearance specification might affect the landowner's quarterly timber allowance under the felling licence regulations.

There are a number of Energy Networks Association publications that outline safe and good practice of vegetation management in the vicinity of electrical equipment.

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<sup>69</sup> <https://www.gov.uk/guidance/tree-health-legislation>

<sup>70</sup> <https://historicengland.org.uk/advice/planning/consents/smc/>

<sup>71</sup> <https://www.gov.uk/guidance/open-access-land-management-rights-and-responsibilities>



## WOODLAND MANAGEMENT – BEST PRACTICE

The UKFS is the reference standard for sustainable forest management in the UK.

UKFS has been endorsed by the UK and country governments and applies to all forests and woodlands. The UKFS is the basis of forestry practice for the independent UK Woodland Assurance Standard (UKWAS), which is used for voluntary independent certification. By meeting the requirements of the UKFS, forest and woodland owners, managers and practitioners can demonstrate that forestry operations and activities are both legal and sustainable. In England, the main body responsible for the regulation and monitoring of the UKFS is the Forestry Commission.

The UKFS Requirements are divided into legal requirements and good forestry practice requirements. The Requirements are categorised into different elements of sustainable forest management, each supported by Guidelines for managers.

The elements are:

- General Forestry Practice
- Biodiversity
- Climate Change
- Historic Environment
- Landscape
- People
- Soil
- Water

The UKFS Guidelines explain the principles of the various elements of sustainable forest management and set out how the UKFS Requirements can be met. The scope of the UKFS does not extend to the management of individual trees (arboriculture), orchards, ornamental trees and garden trees, tree nurseries, or the management of Christmas trees.

## WOODLAND MANAGEMENT PLANS

Woodland management plans are an essential part of the documentation needed to demonstrate adherence to good practice. The Forestry Commission provides template management plans and guidance notes for use by woodland owners/managers. For all woodlands greater than three hectares, the Forestry Commission can assess management plans and approve them, if they meet UKFS. An approved management plan is the starting point for all Countryside Stewardship grants for existing woodlands.

There is further guidance and links to the templates on this [government website](https://www.gov.uk/guidance/create-a-woodland-management-plan).<sup>72</sup>

<sup>72</sup> <https://www.gov.uk/guidance/create-a-woodland-management-plan>

## DEMONSTRATING SUSTAINABLE TIMBER PRODUCTION

The Forestry Commission's Woodland Planning Grant allows woodland owners to demonstrate that timber produced from the woodland is sustainable.

There are two main ways of demonstrating legality and sustainability:

- Category A: a recognised certification scheme e.g. Forestry Stewardship Council (FSC)
- Category B: other evidence of legality and sustainability

An approved Forestry Commission management plan is Category B evidence. Please see Forestry Commission's [Operations Note 022 – Enabling Woodlands to Comply with Government Timber Procurement Policy](#),<sup>73</sup> which explains the application process. All central government departments and their executive agencies are required to procure either legal and sustainable timber or Forest Law Enforcement, Governance Trade (FLEGT) – licensed timber.

## INDEPENDENT FOREST CERTIFICATION

Independent forest certification arose out of concerns over deforestation and degradation of the world's forests, particularly tropical rainforests. From the mid-1990s a range of schemes were developed to give independent assurances that timber bearing the certification label, and the forests from which it is derived, have been responsibly managed. These voluntary schemes define their own standards of management and are independent of governments.

The [Forest Stewardship Council](#)<sup>74</sup> (FSC) and [Programme for the Endorsement of Forest Certification](#)<sup>75</sup> (PEFC) are the two main global certification schemes. Both are owned by international non-governmental organisations and exist to promote sustainable forest management and a system for product assurance. Certification schemes have two key components: a forest management certificate and 'chain of custody' certification, which extends assurances down the forest supply chain. Many different stakeholders, representing the environmental, economic and social aspects of forestry, guide the approaches of both schemes. The schemes allow consumers to identify, purchase and use timber and wood products produced from well-managed forests, through the use of a product labelling system.

## UK WOODLAND ASSURANCE STANDARD AND CERTIFICATION

The [UK Woodland Assurance Standard](#)<sup>76</sup> (UKWAS) is designed to reflect the requirements set out in UKFS. This certification standard is also designed to reflect the requirements of the two leading global certification schemes – FSC and PEFC. Products that are certified through these schemes provide a recognised way to inform customers that timber products come from sustainable managed resources and can be labelled as such. The UK arms of FSC and PEFC take responsibility for submitting the UKWAS standard to their national parent bodies in order to meet with each scheme's requirements.

Woodland owners/managers need to appoint an accredited certification body to carry out audits against the standard. As UKWAS is recognised by both FSC and PEFC schemes it is possible for woodlands to be dual certified if the certification body is accredited to both schemes. Owners of small woodlands can join group certification schemes in order to reduce costs.

## OTHER USEFUL INFORMATION AND GUIDANCE

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73 <https://www.gov.uk/government/publications/enabling-woodlands-to-comply-with-government-timber-procurement-policy-operations-note-22>

74 <https://www.fsc-uk.org/en-uk>

75 <https://www.pefc.org/>

76 <http://ukwas.org.uk/>



## FISA SAFETY GUIDES

For those involved with forestry operations, there are a number of [safety guides](#)<sup>77</sup> produced by the Forest Industry Safety Accord – these replace the Arboriculture and Forestry Advisory Group (AFAG) publications.

## WOODLAND WILDLIFE TOOLKIT

The online [toolkit](#)<sup>78</sup> encourages woodland owners and managers to consider wildlife species that could be in their woods and provides advice on assessment and management practices.

## BIOSECURITY AND WOODLAND MANAGEMENT

In order to help safeguard our trees and woodlands from the introduction and spread of harmful organisms, good biosecurity measures need to be undertaken. Those working with trees and woodlands are a higher risk group as they often work across multiple sites containing trees and may come into contact with infected material through woodland management or tree planting. The Forestry Commission has worked closely with different organisations to create industry-specific biosecurity advice. Their ‘Keep it Clean’ campaign highlights three main areas of activity to focus on: Think Kit, Think Trees and Think Transport.

Further information produced by the Forestry Commission, and Animal and Plant Health Agency, can be found on this [government website](#).<sup>79</sup>

The Arboricultural Association have also produced further guidance within the document [Guidance Note 2 – Application of Biosecurity in Arboriculture for tree practitioners](#).<sup>80</sup>



<sup>77</sup> <https://www.ukfisa.com/safety-information/safety-library/fisa-safety-guides.html>

<sup>78</sup> <https://woodlandwildlifetoolkit.sylva.org.uk/>

<sup>79</sup> <https://www.gov.uk/guidance/prevent-the-introduction-and-spread-of-tree-pests-and-diseases>

<sup>80</sup> [https://www.trees.org.uk/Trees.org.uk/media/Trees.org.uk/Documents/eBooks/AA\\_GuidanceNote2\\_BiosecurityArboriculture-ebook.pdf](https://www.trees.org.uk/Trees.org.uk/media/Trees.org.uk/Documents/eBooks/AA_GuidanceNote2_BiosecurityArboriculture-ebook.pdf)

### ADVICE

For woodland matters including Countryside Stewardship, felling licences and woodland-related EIAs, contact the Forestry Commission.

For information regarding TPOs and conservation areas, contact the local planning office.

For individuals and community groups, Manchester City of Trees have produced a series of 'How to' guides<sup>81</sup> including *Creating a community woodland group* and *Look after your community woodland*. They also provide woodland management advisory services across Greater Manchester.

### TRAINING AND SKILLS

The Royal Forestry Society<sup>82</sup> offers qualifications and certifications in arboriculture and forestry.

The Arboricultural Association<sup>83</sup> offers training courses for arborists and tree surgeons.

The Institute of Chartered Foresters<sup>84</sup> is the professional body that offers Chartered Forester and Chartered Arboriculturalist titles. They also list the training providers of ICF-accredited courses<sup>85</sup> as well as useful links to other forestry careers information.

There are many universities and colleges that offer tree-related courses in England, Scotland and Wales. In the north-west, courses are run by the National School of Forestry<sup>86</sup> at the University of Cumbria, Myersough College<sup>87</sup> at the University of Central Lancashire, Reaseheath College<sup>88</sup> in Cheshire and Newton Rigg College<sup>89</sup> in Penrith.

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81 <http://www.cityoftrees.org.uk/resource/how-guides>

82 <https://www.rfs.org.uk/learning/>

83 <https://www.trees.org.uk/Training-And-Events>

84 <https://www.charteredforesters.org/>

85 <https://www.charteredforesters.org/about-us/education-and-research/arboriculture-forestry-careers/>

86 <https://www.cumbria.ac.uk/study/academic-departments/science-natural-resources-and-outdoor-studies/the-national-school-of-forestry/>

87 <https://www.myerscough.ac.uk/>

88 <https://www.reaseheath.ac.uk/further-education/courses/forestry-and-arboriculture/>

89 <https://www.newtonrigg.ac.uk/the-college/departments/trees-woodland-and-countryside-studies>



## TREES AND SHRUBS OUTSIDE WOODLAND

Individual trees and tree-related features such as hedgerows and orchards play an important role in the urban and rural landscape. Individual trees can be found in urban centres as street trees as well as in public parks and residential gardens. Where there isn't space for woodlands, these features can be even more important in our built up and hard landscaped areas – places that are close to where people live, work and travel.

## TREE AND SHRUB-RELATED LAWS, REGULATION AND PROTECTION

In addition to those listed under the woodland section, there are a number of other regulatory instruments relating to trees:

### TREES NEAR ROADS AND HIGHWAYS

The [Highways Act 1980](#)<sup>90</sup> has many sections that refer to trees, hedges and other vegetation in relation to roads and highways. These include instructing landowners to alter trees and other vegetation to improve sightlines on a corner (section 79); offence of affixing items onto a highway tree without consent of the highway authority (section 132); and serving notice requiring the cutting of trees/hedge which obstructs the passage or view of drivers or light from a street lamp (Section 154).

The government's '[Highway tree management: operations note 51](#)'<sup>91</sup> highlights examples of good practice with respect to trees growing within the curtilage of the highway.

The Department of the Environment Circular ROADS No 52/75 is focused on the inspection of highway trees.

### HEDGEROW REGULATIONS 1997

Under these regulations it is unlawful to remove most countryside hedgerows without written consent from the local planning authority. 'Removal' means uprooting, serious damage to the roots or over-maintenance resulting in the death of the hedge. Proper maintenance, including coppicing, pruning and laying, does not require permission. More information on protection and management of hedgerows can be found on this [government website](#).<sup>92</sup>

The Wildlife and Countryside Act 1981 also gives legal protection to the birds nesting in the hedge, so intentional damage or destruction of an active nest in a hedge is a criminal offence.

Hedgerows need regular cutting to maintain their shape and biodiversity benefits. In some instances they may benefit from laying, coppicing or gapping up. [Cross compliance guidance](#)<sup>93</sup> for land managers receiving Single Farm Payments states that hedges are not to be cut between 1 March and 31 July – hedge and tree coppicing, and laying is permitted for a further month (end of April).

90 <https://www.legislation.gov.uk/ukpga/1980/66>

91 <https://www.gov.uk/government/publications/highway-tree-management-operations-note-51>

92 <https://www.gov.uk/guidance/countryside-hedgerows-regulation-and-management>

93 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/668684/Cross\\_Compliance\\_2018\\_guide\\_v1.0.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/668684/Cross_Compliance_2018_guide_v1.0.pdf)

## ANTI-SOCIAL BEHAVIOUR ACT 2003 PART 8

Under this Act statutory regulations were introduced to address the problem of neighbourly disputes over high boundary hedges. The regulations only apply to domestic properties and those hedges that are evergreen or semi-evergreen species. The government have produced a document on the regulations in the publication [Over the Garden Hedge](https://www.gov.uk/government/publications/over-the-garden-hedge),<sup>94</sup> which gives guidance on how to settle hedge differences without involving the local authority. There is also a [government guide](https://www.gov.uk/government/publications/high-hedges-complaining-to-the-council)<sup>95</sup> on how local authorities deal with disputes and how owners can make complaints.

## BRITISH STANDARDS

### **BS 3998:2010 Tree Work – Recommendations**

The standard gives guidance on management options for established trees (including soil care and tree felling) and overgrown hedges. For example, it gives guidance on pruning, crown thinning and crown lifting. The standard considers the impact of work on an individual tree in relation to neighbouring trees but does not cover overall management of tree populations.

### **BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations**

This standard provides recommendations relating to tree care, with a view to achieving a sustainable relationship between new construction/existing structures and their surrounding trees. It includes guidance on tree surveys through to planting design and ground works.

The standard follows a logical sequence of events that has tree care at the centre of the process when a new construction project is planned. Its recommendations can be applied whether or not planning permission is required.



<sup>94</sup> <https://www.gov.uk/government/publications/over-the-garden-hedge>

<sup>95</sup> <https://www.gov.uk/government/publications/high-hedges-complaining-to-the-council>



## BEST PRACTICE AND GUIDANCE

## URBAN TREE GUIDES

**Tree Design and Action Group (TDAG) Trees in the Townscape – A Guide for Decision Makers**

This [urban tree guide](http://www.tdag.org.uk/uploads/4/2/8/0/4280686/tdag_trees-in-the-townscape_november2012.pdf)<sup>96</sup> provides the principles and references for decision makers to realise the benefits of trees in neighbourhoods. The 12 principles go from the planning stage, through tree selection and finish with management of the tree resource. There are numerous case studies and references listed.

**Tree Design and Action Group (TDAG) Trees in Hard Landscapes – A Guide for Delivery**

This [guide](http://www.tdag.org.uk/uploads/4/2/8/0/4280686/tdag_trees-in-hard-landscapes_september_2014_colour.pdf)<sup>97</sup> explores the key stages in managing or maintaining trees in hard landscapes. There are sections on project initiation, design, technical solutions and species selection – all illustrated with case studies.

**Trees and Utilities**

The [NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees](http://streetworks.org.uk/wp-content/uploads/V4-Trees-Issue-2-16-11-2007.pdf)<sup>98</sup> document outlines how trees function, how they can be damaged and has guidance on how to avoid damage both above and below ground.

The aim of the [Energy Networks Association publication, Engineering Technical Report 136 ‘Vegetation Management Near Electricity Equipment – Principles of Good Practice’](http://www.energynetworks.org/assets/files/electricity/engineering/engineering%20documents/ENA_ETR_136_Issue_1_080109.pdf)<sup>99</sup> is to present principles of good vegetation management in the vicinity of electricity network equipment.

**House Building and Foundations**

The [National House Building Council \(NHBC\) Standards Chapter 4.2](http://nhbccampaigns.co.uk/landingpages/techzone/previous_versions/2011/Part4/section2/default.htm)<sup>100</sup> gives information on the design of new foundations in proximity to trees, hedgerows and shrubs, particularly on shrinkable clays.

**Ancient and Veteran Trees**

The Ancient Tree Forum website has information on the management and care of ancient and veteran trees. Guidance can be downloaded from its [resources section](http://www.ancienttreeforum.co.uk/resources/)<sup>101</sup> and there are a series of videos demonstrating the practical management of veteran trees.

96 [http://www.tdag.org.uk/uploads/4/2/8/0/4280686/tdag\\_trees-in-the-townscape\\_november2012.pdf](http://www.tdag.org.uk/uploads/4/2/8/0/4280686/tdag_trees-in-the-townscape_november2012.pdf)

97 [http://www.tdag.org.uk/uploads/4/2/8/0/4280686/tdag\\_trees-in-hard-landscapes\\_september\\_2014\\_colour.pdf](http://www.tdag.org.uk/uploads/4/2/8/0/4280686/tdag_trees-in-hard-landscapes_september_2014_colour.pdf)

98 <http://streetworks.org.uk/wp-content/uploads/V4-Trees-Issue-2-16-11-2007.pdf>

99 [http://www.energynetworks.org/assets/files/electricity/engineering/engineering%20documents/ENA\\_ETR\\_136\\_Issue\\_1\\_080109.pdf](http://www.energynetworks.org/assets/files/electricity/engineering/engineering%20documents/ENA_ETR_136_Issue_1_080109.pdf)

100 [http://nhbccampaigns.co.uk/landingpages/techzone/previous\\_versions/2011/Part4/section2/default.htm](http://nhbccampaigns.co.uk/landingpages/techzone/previous_versions/2011/Part4/section2/default.htm)

101 <http://www.ancienttreeforum.co.uk/resources/>

## ORCHARD MANAGEMENT GUIDANCE/BEST PRACTICE

- The felling of fruit trees within orchards is not currently protected through Tree Acts i.e. a felling licence is not needed.
- The People's Trust for Endangered Species has produced a series of [practical guides](#)<sup>102</sup> touching on subjects such as grafting and pruning.
- The Royal Horticultural Society has a [webpage](#)<sup>103</sup> with links to apple tree management including pruning and training.

## HEDGEROW MANAGEMENT

- Information on the hedgerow management cycle can be found in this [hedgelink guide](#).<sup>104</sup> Hedgelink has also produced a [Hedge Good Management Guide](#).<sup>105</sup>
- The People's Trust for Endangered Species has some top tips for [managing hedgerows](#).<sup>106</sup>
- The Royal Horticultural Society has [guides](#)<sup>107</sup> on different aspects of hedge management and planting, aimed more at the garden scale of working.

## 4.2 WOODLAND MANAGEMENT IN GREATER MANCHESTER

Due to the different ways in which woodland can be managed and its cyclical nature, it is very difficult to accurately quantify the extent of woodland management activity across Greater Manchester. Those woodlands that are certified to recognised standard such as Forestry Stewardship Council (which includes Forestry Commission and Woodland Trust land) can be assumed to be sustainably managed.

Other sources of information such as felling licence and woodland management plan approvals (from the Forestry Commission) can help estimate a broad picture of management activity.

However, it is clear that most woodlands in Greater Manchester do not have an up to date management plan or schedule of operations. One of the ongoing challenges for woodland managers is getting the resources to support plan production and its upkeep as well as the delivery of operations within it.

## MANAGING WOODS SUSTAINABLY – COMMON THEMES AND CHALLENGES

Woodland management objectives need to consider both the woodland managers/owners aims as well as the woodland character and features. This planning process is outlined in UKFS guidelines and [Forestry Commission guidance notes](#)<sup>108</sup> for their template management plans. There are, however, many recurring themes that need to be considered regardless of the management objectives in order for sustainable forest management to be achieved.

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102 <https://ptes.org/campaigns/traditional-orchard-project/orchard-practical-guides/>

103 <https://www.rhs.org.uk/advice/garden-features/hedges>

104 [http://www.hedgelink.org.uk/cms/cms\\_content/files/78\\_hedgelink\\_a5\\_12pp\\_leaflet\\_7.pdf](http://www.hedgelink.org.uk/cms/cms_content/files/78_hedgelink_a5_12pp_leaflet_7.pdf)

105 [http://www.hedgelink.org.uk/cms/cms\\_content/files/30\\_complete\\_good\\_hedge\\_management\\_guide\\_leaflet.pdf](http://www.hedgelink.org.uk/cms/cms_content/files/30_complete_good_hedge_management_guide_leaflet.pdf)

106 <https://ptes.org/hedgerow/managing-hedgerows-top-tips/>

107 <https://www.rhs.org.uk/advice/garden-features/hedges>

108 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/698703/Creating-a-woodland-management-plan-Author-guidance.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/698703/Creating-a-woodland-management-plan-Author-guidance.pdf)



These common themes include:

**Maintaining the current or desired extent of woodland** i.e. woodland not being lost to other land uses. This includes ‘land creep’ of back gardens into woodland.

**Tree health and safety** – a regime of inspections needs to be outlined – frequency and type to be determined by site factors (tree size, stability, etc.) and presence of ‘targets’. For larger or more complex woodland holdings this information is often in its own document. Litigation and court cases can place additional emphasis on tree safety, inspection regimes and ultimately budgets.

**Deadwood** – deadwood is an important component of the woodland structure. There should be an element of deadwood in all woods, ideally a mix of dimensions with some standing. Health and safety considerations may limit or restrict the amount of standing deadwood or where it can be allowed to develop. Individual woodlands can have a target level of standing dead typically measured by volume or number of stems per hectare (over a certain diameter).

**Structural diversity (of trees/shrubs)** – this includes the mix of heights, ages and habit of the woody element of the woodland. A more diverse structure offers more resilience to negative influences such as pests and diseases. Within very small, mature woods improving structural diversity can be more difficult but opportunities for replanting/restocking/underplanting can be taken advantage of when they occur.

**Species diversity (of trees/shrubs)** – a more species-diverse woodland offers more resilience to negative influences such as pests and diseases. Within very small woodlands, achieving diversity of species can be difficult without removing healthy mature trees which is generally undesirable. Where possible, planting up suitable existing canopy gaps with other site suitable species as well as underplanting with more shade tolerant species should be considered.

**Reduction/removal of invasive non-natives** – species such as rhododendron, Japanese knotweed and Himalayan balsam are commonly found across Greater Manchester and can negatively affect the diversity and biodiversity of woodland. Control measures should be considered particularly if sensitive or important woodland features are at threat.

**Ash dieback** – this disease is present across Greater Manchester. From Forestry Commission survey data (as of September 2019), only two (10 x 10km) grid squares in Greater Manchester have yet to have ash dieback reported within them. It is highly likely that the disease is present in those areas but has yet to be formally recorded. The disease will cause the premature death of many ash trees and will severely affect the health of most of the population. Woods with a component of ash trees should plan for increased ash mortality and poor health, and the additional resources needed to manage or replace the trees. For more information please see this [Forestry Commission website](https://www.forestry.gov.uk/ashdieback)<sup>109</sup> and the [Tree Council Ash Dieback Action Plan Toolkit](https://www.treecouncil.org.uk/Portals/0/Chalara%20docs/The%20Tree%20Council%20Ash%20Dieback%20Action%20Plan%20Toolkit%20FINAL.pdf)<sup>110</sup>.

109 <https://www.forestry.gov.uk/ashdieback>

110 <https://www.treecouncil.org.uk/Portals/0/Chalara%20docs/The%20Tree%20Council%20Ash%20Dieback%20Action%20Plan%20Toolkit%20FINAL.pdf>

A useful **advice note**<sup>111</sup> produced by the Devon Ash Dieback Resilience Forum highlights the key messages for landscape maintenance and restoration. City of Trees produced a **leaflet**<sup>112</sup> in 2014 which contains information, advice and guidance on ash dieback.

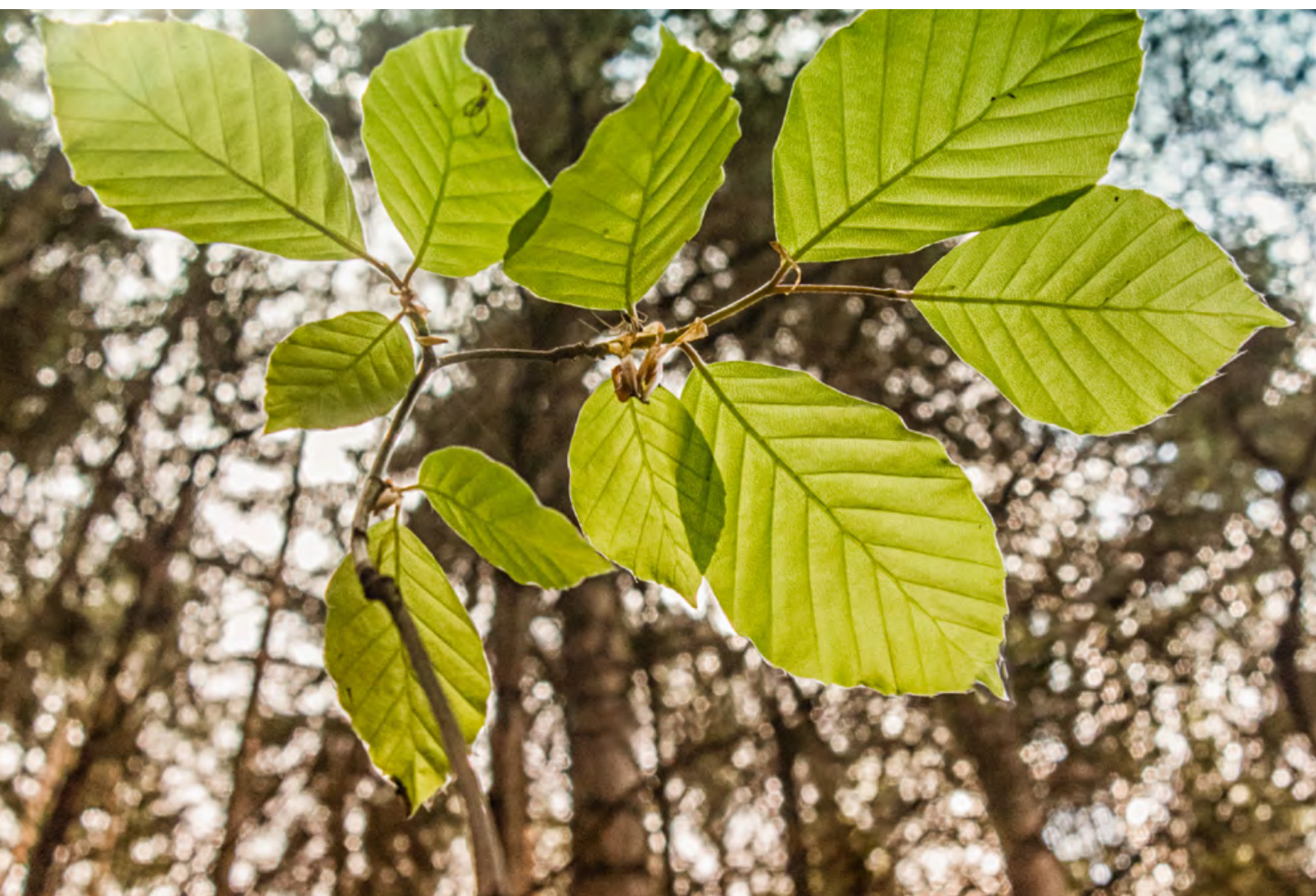
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**Vehicle access for management** – many of the woodlands in Greater Manchester are located on land that is steep-sided, wet or landlocked by urban development. Gaining machine access to undertake management operations or remove timber economically is a problem, which is exacerbated by the typically small size of woodlands.

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**Anti-social behaviour and maintenance** – many urban woods suffer different types of anti-social behaviour such as littering, fly-tipping and vandalism. This places additional demands on budgets and resources, and can ultimately lead to a spiral of undermanagement and neglect. Ongoing woodland maintenance/management such as keeping entrances clear and thinning, may be delayed or indefinitely postponed as resources are diverted to more immediate management concerns.

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111 <https://www.naturaldevon.org.uk/wp-content/uploads/2018/10/Replacing-ash-appropriate-tree-selection.pdf>

112 <https://heritagetrees.org.uk/sites/default/files/resources/GM-HT-Ash-Dieback-A4.pdf>



**Grey squirrel** – grey squirrel is found across all of Greater Manchester. Damage to young and vulnerable trees is varied, but those woodlands with high percentages of thin barked species (e.g. beech and sycamore) will inevitably bear the worst of bark stripping. Control of grey squirrel is problematic on many fronts – scale of action needed, cost, public perception, etc. As very few woodlands have been grown with timber objectives in mind, damage to trees has not been seen as significantly negatively affecting management objectives (mostly around public access and biodiversity). There is anecdotal evidence that red squirrel has been sighted in woods at the far west of the Greater Manchester near Billinge, in some conifer-dominated woodland. These individuals are possibly part of a small population found across St Helens.

**Deer** – sightings of deer in and around Greater Manchester appear to have risen over the last decade or so. They are increasingly being spotted in more urban surroundings. Browsing damage to woodland ground flora appears not to be significant although those really rural or isolated woods may be more affected. Replanting or natural regeneration within and around existing woods needs to consider potential deer damage. Other factors such as wind speed, risk of vandalism and damage from other animals needs to be thought through when considering tree protection. For similar reasons to squirrel control, deer have generally not been controlled or culled.

## WOODLANDS ACROSS GREATER MANCHESTER'S DIFFERING LANDSCAPES

There is a great variety of woodland types and landscapes across Greater Manchester. Woodlands within certain locations or landscape characters can have particular needs or themes of management. The Greater Manchester Landscape Character and Sensitivity Assessment (produced by Land Use Consultants for the GMCA) identifies 10 broad Landscape Character Types (LCTs).

These character types have been drawn from assessing land identified within the Greater Manchester Green Belt Assessment as well as other areas of open land included in previous district-scale landscape character assessments. Approximately half of Greater Manchester has been assigned an LCT by the Assessment. In order to ensure that all land in Greater Manchester is considered, with respect to its woodland, an eleventh category of land has been termed here – Urban – to encompass the remainder of the non-open land.

The 10 Landscape Character Types are:

- Broad Urban Fringe Valleys
- Historic Parks and Wooded Estate Farmland
- Incised Urban Fringe Valleys
- Open Moorlands and Enclosed Upland Fringes (Dark Peak)
- Open Moorlands and Enclosed Upland Fringes (West/South Pennines)
- Mosslands and Lowland Farmland
- Pennine Foothills (Dark Peak)
- Pennine Foothills (West/South Pennines)
- Reclaimed Land/Wetlands
- Urban Fringe Farmland

Within these LCTs there are 46 Landscape Character Areas – smaller, geographically unique areas of land.

As the Landscape Character Assessment did not include a portion of land in Oldham district that falls within the Peak Park National Park, there is an additional listing for woods in this area in [Table 3](#).

The following sections will briefly summarise each LCT's woodland holding – highlighting common themes of management.

**TABLE 3: SUMMARY TABLE OF GREATER MANCHESTER'S WOODLANDS**

The following table illustrates the amounts of woodland found across the different LCTs. The woodland cover data used in the table is taken from the Greater Manchester Tree Audit (GMTA) 2011.

LCT	LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
Broad Urban Fringe Valleys	2,191	14	314	10	32	104
Historic Parks and Wooded Estate Farmland	5,117	22	1,126	14	131	610
Incised Urban Fringe Valleys	8,000	27	2,188	9	262	905
Mosslands and Lowland Farmland	8,097	8	652	71	8	318
Open Moorlands and Enclosed Upland Fringes (Dark Peak)	3,522	5	179	0	24	60
Open Moorlands and Enclosed Upland Fringes (West/South Pennines)	13,286	4	482	5	67	234
Pennine Foothills (Dark Peak)	3,283	14	466	9	143	253
Pennine Foothills (West/South Pennines)	5,489	5	284	0	54	127
Reclaimed Land/Wetlands	4,925	13	654	20	0	201
Urban Fringe Farmland	8,641	4	386	0	79	148
'Urban' LCT	62,017	3	2,007	2	53	366
Oldham National Park Area	3,103	2	60	0	0	11
<b>Total</b>	<b>127,671</b>	<b>7*</b>	<b>8,798</b>	<b>1</b>	<b>853</b>	<b>3,337</b>

\*average

**Woodland cover** – the total amount of woodland canopy cover within the LCT from the GMTA 2011. Canopies of individual trees or very small groups of trees were not included.

**Woodland within SSSI** – the area of woodland cover (from GMTA) that falls within a SSSI boundary. The SSSI may, or may not, be designated because of the woodland within it.

**Ancient Woodland** – includes those sites which are Ancient Semi-Natural Woodland and Plantation on Ancient Woodland Sites.

**Woodland within SBI** – the area of woodland cover (from GMTA) that falls within a Site of Biological Importance (SBI). The SBI may, or may not, be designated because of the woodland within it.



## BROAD URBAN FRINGE VALLEY

This Landscape Character Type contains two Landscape Character Areas – River Bollin and River Mersey. Both of these areas lie in the south of Greater Manchester, sitting across Trafford, Manchester and Stockport districts.

The River Bollin is closely fringed by woodland – some of which is ancient e.g. Cotteril Clough adjacent to Manchester Airport.

Across the Mersey Valley Area there are many small areas of woodland, many of which form part of the structure planting associated with the M60/M56 and golf courses.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
2,191	14	314	10	32	104

### COMMON MANAGEMENT THEMES:

- **Non-native invasives** – those more associated with riparian woodland e.g. Himalayan balsam and giant hogweed.
- **Fluvial flooding** – many of the woods will be within Flood Zones 2 and 3. Some areas near to the River Mersey are flood storage areas.
- **Unthinned areas of younger areas of woodland planted 15–25 years ago.**
- **Vehicle access for management** – steep slopes and wet areas.
- **Managing public access across local authority owned woodland.**
- **High biodiversity value woodland features** – associated with Ancient Woodland sites along the Bollin Valley.
- **Management of willow tit habitat.**
- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.
- **Anti-social behaviour** – proximity to urban areas means that some anti-social behaviour can occur in these woodlands such as vandalism, fly-tipping, fire setting and unauthorised motor vehicle use.



## HISTORIC PARKS AND WOODED ESTATE FARMLAND

This character type contains eight Landscape Character Areas – most of these are in the central or western half of Greater Manchester. The landscape is predominantly rural and well-wooded with many of the former estate landscapes in recreational use. Some of the landscape structure within the area is provided by the broadleaved woodlands and semi-natural woodland cloughs e.g. Philips Park and Mere Clough (Bury). There are small areas of Ancient Woodland linked with many estate woodlands, often planted with game cover species. Some woodlands have been planted as structure planting and can be found along motorways.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
22%	1,126	14	131	610	22%

### COMMON MANAGEMENT THEMES:

- **Non-native invasives e.g. rhododendron.**
- **Nurse species planted e.g. larch and pine present. Concerns over *Phytophthora ramorum* and *Dothistroma* needle blight diseases** – and management of infected trees felling licence considerations, replanting different species.
- **Structural diversity of tree populations** – aging population of trees/need for more structural diversity.
- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.

## INCISED URBAN FRINGE VALLEYS

This landscape character type contains 11 Landscape Character Areas – typically, narrow tracts of land. The areas are found across nine of the 10 districts of Greater Manchester (not Trafford). Most of the woodlands are directly associated with rivers and watercourses. In some areas, woodland makes up a relatively sizable percentage of the land cover e.g. along the River Douglas near Shevington. Woodland cover is typically found on the steep-sided valleys, often as narrow strips following the general landform and contours.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
8,000	27	2,188	9	262	905

### COMMON MANAGEMENT THEMES:

- **Non-native invasives** – those more associated with riparian woodland e.g. Himalayan balsam and giant hogweed.
- **Fluvial flooding** – many of the woods will be within Flood Zones 2 and 3.
- Vehicle access for management – steep slopes and wet areas.
- **Managing public access across local authority owned woodland.**
- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.



## MOSSLANDS AND LOWLAND FARMLAND

This character type contains six Landscape Character Areas and is found across the districts of Wigan, Bolton, Bury, Salford, Trafford and Tameside. Most are around the west of Greater Manchester and are generally quite large and expansive. The areas comprise of generally flat or gently undulating land. The floodplain landscapes tend to have regular geometrical fields with open ditches interspersed with remnant mossland and moss woodlands. As such, many of the woods are geometrical in shape or have straight-line boundaries. The mosslands are designated for their biodiversity value – ranging from Site of Biological Importance through to Site of Special Scientific Interest and Special Area for Conservation. There are very few areas of Ancient Semi-Natural Woodland within this Character Type but woodland does form part of some of the SAC/SSSI area although other habitat (e.g. lowland raised bog) may be the primary reason for the designation.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
8,097	8	652	71	8	318

### COMMON MANAGEMENT THEMES:

- **Non-native invasives e.g. rhododendron.**
- **Unthinned areas of younger areas of woodland planted 15–25 years ago.**
- **Woodland and trees growing on peatlands** – balance of site management objectives and different habitat needs.
- **Ditch and water level management.**
- **Management of willow tit populations.**
- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.

## OPEN MOORLANDS AND ENCLOSED UPLAND FRINGES (DARK PEAK)

This character type contains three Landscape Character Areas and is found on the eastern edge of Greater Manchester – within Oldham, Tameside and Stockport districts. The land is mostly elevated upland with open moorland and undulating upland pastures. Woodland forms part of the many habitat mosaics across the type although it is found on the lower ground and along the valleys. Mixed and broadleaved woodlands frequently trace the watercourses and reservoirs. Shelterbelts and woodland planting often screen farm buildings and settlements. The Pennine Bridleway and Tameside Trail routes go through many patches of woodland.

The section of Greater Manchester that falls within the Peak District National Park, had it been assessed, may well have had much of the land characterised as this type.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
3,522	5	179	0	24	60

### COMMON MANAGEMENT THEMES:

- **Woods at higher elevations** – exposure and higher winds; potential windblow in plantations and difficulties around thinning.
- **Vehicle access for management** – steep slopes.
- **Moorland/upland fires** – damage to habitats, cost of control/restoration.
- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.

## OPEN MOORLANDS AND ENCLOSED UPLAND FRINGES (WEST/SOUTH PENNINES)

This character type contains seven Landscape Character Areas and is spread across the northern and north-eastern edge of Greater Manchester. It falls within the districts of Bolton, Bury, Rochdale and Oldham districts. The land is typically elevated, of poor agricultural quality with low woodland cover particularly across the unenclosed uplands. Coniferous and mixed plantations are associated with quarries and reservoirs. Much of the character type in the north-east is designed as part of the South Pennines SAC/SPA.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
13,286	4	482	5	67	234

### COMMON MANAGEMENT THEMES:

- **Woods at higher elevations** – exposure and higher winds; potential windblow in plantations and difficulties around thinning.
- **Vehicle access for management** – steep slopes.
- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.
- **Moorland/upland fires** – damage to habitats, cost of control/restoration conifer plantations **containing pine or larch** – *Phytophthora ramorum* and *Dothistroma* needle blight diseases concerns.
- **Public access within country parks and other similar sites** – maintaining good conditions along well-used, long-distance routes and within other public facilities e.g. car parks.

## PENNINE FOOTHILLS (DARK PEAK)

This character type contains three Landscape Character Areas, which are sandwiched between the eastern urban areas of Greater Manchester and the wider more open moorland areas. It stretches across the districts of Oldham, Tameside and Stockport – close to the valleys of the Rivers Tame, Medlock, Etherow and Goyt. Many of the cloughs contain areas of woodland. Compstall Nature Reserve's woodland (part of Etherow Country Park) is designated as a SSSI.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
3,283	14	466	9	143	253

### COMMON MANAGEMENT THEMES:

- **Vehicle access for management** – steep slopes.
- **Woods at higher elevations** – exposure and higher winds; potential windblow in plantations and difficulties around thinning.
- **Public access** – management within recreational sites including tree safety.
- **High biodiversity value woodland features** – associated with Ancient Woodland sites.
- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.



## PENNINE FOOTHILLS (WEST/SOUTH PENNINES)

This character type contains five Landscape Character Areas. These areas lie to the north of Greater Manchester across the districts of Bolton, Bury, Rochdale and Oldham. The woodland is scattered thinly across some areas while some larger blocks can be found in Rochdale (along the Cheesden Brook) and in Oldham (Tandle Hill Country Park). Most of the Ancient Woodland falls within Rochdale district near the Naden and Cheesden Brooks.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
5,489	5%	284	0	54	127

### COMMON MANAGEMENT THEMES:

- **Vehicle access for management** – steep slopes.
- **Woods at higher elevations** – exposure and higher winds; potential windblow in plantations and difficulties around thinning.
- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.

## RECLAIMED LAND/WETLANDS

This character type contains three Landscape Character Areas and they are concentrated in the west of Greater Manchester across the districts of Wigan, Bolton and Salford with a smaller area near Middleton. Much of the landform here was created as a result of mining subsidence and inundation. There are some naturally regenerated carr woodlands associated with the wetlands as well as some plantation woodland created as part of restoration works post mining e.g. Bickershaw in Wigan. Some of these are managed by the Forestry Commission e.g. Viridor Wood, Byrom Wood and Colliers Wood in Wigan.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
4,925	13%	654	20	0	201

### COMMON MANAGEMENT THEMES:

- **Pioneer species planted/regenerated in many of the woods e.g. lots of alder and willow** – may need to be diversified to help with resilience and general species diversity.
- **Managing sites for willow tit** – early succession scrub is preferred but many young woods will want to revert to high-canopy woodland.
- **Balance between woodland cover and other habitat (wetland) needs** – ongoing management to maintain earlier successional habitat.
- **Uncertainties regarding soil depth and condition may increase risk of windblow and tree health issues on reclaimed sites.**
- **Public access** – management within recreational sites including tree safety.

## URBAN FRINGE FARMLAND

This character type contains 14 Landscape Character Areas and is quite widespread and dispersed across the whole of Greater Manchester – all districts have some land that falls within the type. Woodland cover across this area is relatively sparse. There are many golf courses spread over this area which contain smaller area of trees and woodlands e.g. Bramhall Golf Club. Along some of the watercourses there are larger patches of woodland e.g. Boresdane Wood near Westhoughton, and woodland along Torkington Brook in Stockport.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
8,641	4	386	0	79	148

### COMMON MANAGEMENT THEMES:

- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.
- **Anti-social behaviour** – proximity to urban areas means that some anti-social behaviour can occur in these woodlands such as vandalism, fly-tipping, fire setting and unauthorised motor vehicle use.





## URBAN

The Urban land within Greater Manchester is the remainder of land not categorised by the Greater Manchester Landscape Character and Sensitivity Assessment and therefore has no assigned Landscape Character Type. It is typically urban or suburban in nature and can include industrial, institutional, transport, retail and recreational land uses. This Urban category covers a land equal in size to all the other Landscape Character Types put together. Woodlands within this area are closest to the densest areas of population with many of them being in public ownership. With this close proximity to people comes many issues and opportunities. These woods are seen and used by more people than any other in Greater Manchester.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
62,017	3%	2,007	2	53	366

### COMMON MANAGEMENT THEMES:

- **Fly-tipping/litter** – this problem is common to most urban woods. Tipped rubbish can arrive by vehicle directly or from adjoining land, typically residential gardens. Common tools for the management of fly-tipping include site height barriers and improving sightlines to areas of issue. Littering can be more of a visual problem and can be an educational issue e.g. schools use nearby. The installation of bins can help to reduce littering but maintenance and emptying costs need to be considered.
- **Invasives/garden escapes** – in addition to the usual invasive non-native species, other species such as variegated yellow archangel can become established. With any species control a judgement on its effects on the woodland and its management objectives and the cost/difficulty of control needs to be made.
- **Managing public access** – within publicly owned woods keeping them looking inviting and accessible to users as well is an ongoing issue. With reduced local authority budgets and staff management input, access infrastructure such as paths and gates can become worn or tired and difficult to repair.
- **Unauthorised vehicle use** – typically unauthorised and illegal use of motor bikes and 4x4 motor vehicles. Damage to paths and other access infrastructure can be seen. In extreme cases, barriers, bollards and other controlling structures are ripped out or cut and legitimate users are dissuaded from using the woods. Building a case for police involvement – reporting of incidents by local people can build up a local profile and add weight for direct police intervention. However, there can be issues with length of time to answer calls and long response times which can lead to apathy in local reporting. Sites with large peripheries can be very difficult to prevent or reduce motorbikes that also allow wheelchair or pram use at the same time. Article 59 (Highways Act) signs can be used as a first warning.
- **Vandalism** – includes a large variety of activities such as fencing damage and setting fires within the base of trees. In many cases, management activities such as those to encourage public access have a similar benefit in opening up sightlines and making anti-social behaviour less likely. Having on-site presence of staff or increased public usage can also help to discourage unwanted behaviour.
- **Boundary management** – as many urban woods back onto residential properties or development, boundary fences/features are often stressed more than would be otherwise. This stress often results in greater wear and tear, causing higher costs of maintenance and replacement.

## PEAK DISTRICT NATIONAL PARK (OLDHAM) AREA

This area of land within the Greater Manchester district of Oldham falls within the Peak District National Park. As such it was not assessed and assigned a Landscape Character Type by the consultants. Most of the landscape appears to be similar in nature to the Open Moorlands and Enclosed Upland Fringes LCTs.

All the woodland blocks are situated to the west and are focused around the reservoirs of Dove Stone and Yeoman Hey. These woodlands appear to be plantations, containing coniferous and broadleaved species.

LCT Area (ha)	Woodland cover (%)	Woodland cover (ha)	Woodland within SSSI (ha)	Ancient Woodland (ha)	Woodland within SBI (ha)
3,103	2%	60	0	0	11

### COMMON MANAGEMENT THEMES:

- **Woods at higher elevations** – exposure and higher winds; potential windblow in plantations and difficulties around thinning.
- **Vehicle access for management** – steep slopes.
- **Deer browsing** – deer numbers may be impacting on ground flora or make diversification of woodland species or restocking difficult.
- **Conifer plantations containing pine or larch** – *Phytophthora ramorum* and *Dothistroma* needle blight diseases concerns.





## 4.3 NEW PLANTING

### INTRODUCTION

Successful tree planting – where trees thrive and flourish – relies on a series of connected activities from careful planning through to effective maintenance. BS 8545:2014 “Trees: From nursery to independence in the landscape – recommendations” is a critical document and sets out and illustrates this process via flow charts and detailed explanation.

The principles of good tree planting are the same whether the tree is planted in a field as part of a woodland, in an urban setting in hard landscaping or as part of a hedgerow or orchard. The complexity of planting locations, particularly in our urban, hard landscaped areas, means that different technical solutions are needed to achieve healthy and long-lived trees.

The following documents give details and insight into the principles and practice of planting trees with reference to the urban environment:

**Trees and Design Action Group Trees in Hard Landscapes – A Guide to Delivery**<sup>113</sup> explores the building blocks to successful planting and management of urban trees. The Guide has chapters on Designing with Trees, Technical Design Solutions and Species Selection. There are case studies and references to useful documents. It is a companion document to TDAG’s Trees in the Townscape: A Guide for Decision Makers.

**The Urban Tree Manual**<sup>114</sup> focuses on advice for choosing the right tree for the right place within urban areas as well as longer-term threats and the benefits that urban trees can provide. The document has been put together by experts from Forest Research, Forestry Commission, Royal Horticultural Society, and the Animal and Plant Health Agency.

Manchester City Council has produced a City Centre Street Tree Planting Standard within their main Planning Application Validation Checklist, which outlines the following specification:

- Tree size: 18-20cm/20-25cm girth
- Pit dimensions: depth up to 1m, width 1-1.2m and length 3m
- Preferably use modular systems containing topsoil and subsoil conforming to BS 3882:2015 and BS 8601:2013
- Surface of pit should be permeable to allow oxygen and water through

### TREE PLANTING PLANNING AND DECISION-MAKING PROCESS

Urban planting guidance documents often break the tree planting and decision-making process into a series of stages from objective setting through to post-planting maintenance. The following headings summarise those stages:

### ORGANISATIONAL POLICIES, SCHEME OBJECTIVES AND LEGAL CONSIDERATIONS

This includes considering statutory and legal controls as well as the overall planting scheme objectives.

<sup>113</sup> [http://www.tdag.org.uk/uploads/4/2/8/0/4280686/tdag\\_trees-in-hard-landscapes\\_september\\_2014\\_colour.pdf](http://www.tdag.org.uk/uploads/4/2/8/0/4280686/tdag_trees-in-hard-landscapes_september_2014_colour.pdf)

<sup>114</sup> <https://www.forestresearch.gov.uk/tools-and-resources/urban-tree-manual/>

## Environmental Impact Assessment Regulations for Afforestation

The Forestry Commission is responsible for administering the Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999, as amended.

For afforestation projects, managers should check the thresholds to see if information needs to be supplied to the Forestry Commission regarding the proposed scheme. Guidance regarding these thresholds and the EIA process can be found in this [Forestry Commission webpage](#)<sup>115</sup>. An EIA Opinion Request Form can be completed to see if consent is needed to carry out planting.

### Planting next to water courses

In England, any works within eight to 10 metres of a main river (including tree planting and other planting) require permission from the Environment Agency.

## SITE EVALUATION AND CONSTRAINTS

### Landscape and local climate

The local environment and the visual elements of the surrounding landscape can influence the scale and nature of the planting. Light levels and wind speeds can also influence planting project specifications.

### Soils and ground conditions

An assessment of the soils and ground conditions at the planting location can include soil pH, soil structure, drainage and compaction. In soft or naturalistic settings, the existing ground vegetation can provide useful indicators as to the nature of the ground conditions and whether any amelioration is needed. As an example, areas where bramble or bracken are present indicate relatively fertile soil conditions. Compaction of soils is a common factor across street tree and woodland planting schemes particularly on brownfield land.

Looking at old aerial photographs or maps can reveal previous land uses that may hint at rooting or growing constraints.

For street trees, the urban environment is challenging above and below ground.

## WOODLAND PLANTING DESIGN

Part of the woodland creation design process involves an initial desk-based assessment using a variety of online information from websites such as the Forestry Commission's [Land Information Search](#)<sup>116</sup>, DEFRA's [MAGIC](#)<sup>117</sup> and [NBN Atlas](#)<sup>118</sup>. These websites can help identify sensitive areas or features that need to be considered in the design process. Following the site and desk-based assessments, a site appraisal map can be produced. Using this map, more detail can be added to produce a design concept map which can show one or more options developed from the analysis. The concept plan can be used for wider consultation and discussion before a woodland creation design plan is produced – a more detailed document and map(s). More information on the design process can be found in the UK Forest Standard Chapter 6.4.

For more upland planting, Moors for the Future have produced a [Clough Woodland Project Guiding Principles](#)<sup>119</sup> document to help support native woodland creation.

## TREE SPECIES SELECTION

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115 <https://www.gov.uk/government/publications/eia-enquiry-form-afforestation>

116 <https://www.forestergis.com/Apps/MapBrowser/>

117 <https://magic.defra.gov.uk/>

118 <https://nbnatlas.org/>

119 <https://www.moorsforthefuture.org.uk/our-work/our-projects/clough-woodland-project>



There are many different plant characteristics (e.g. foliage, ultimate size, etc.) and tolerances that need to be considered when choosing species. In addition to these, the ecosystem services (and disservices) need to be considered as well as climate change and pest and disease resilience.

There are a number of decision-support tools that can aid the tree selection process:

- The [Right Trees for Changing Climate](http://www.righttrees4cc.org.uk)<sup>120</sup> website
- [Tree Species Selection for Green Infrastructure](https://www.myerscough.ac.uk/media/4052/hirons-and-sjoman-2018-tdag-tree-species-selection-1-1.pdf):<sup>121</sup> University Centre Myerscough, Lancaster University, Tree and Design Action Group
- Forest Research's Decision Support Tool: [Ecological Site Classification](http://www.forestdss.org.uk/geoforestdss/esc4m.jsp)<sup>122</sup>

### Ecosystem services

Those trees with larger canopies offer the greatest ecosystem benefits in terms of air quality, water interception, shading, cooling and carbon storage. The Urban Tree Manual suggests some plant characteristics for improving air quality:

- Large canopy area
- Being in leaf all year round
- Wrinkled leaf surface, with the presence of micro-roughness, veins or hairs
- A high-canopy density that is still porous enough to allow air movement through it

Solutions to surface water issues in urban landscapes can include the incorporation of Sustainable Drainage Systems (SuDS) techniques. Further information can be found in TDAG Trees in Hard Landscapes and CIRIA publications.

### Disservices

Urban trees can cause disservices such as honeydew sap on vehicles, excessive fruit fall on pavements and issues around allergies and pollen. Within the TDAG species selection guide, there is an 'Issues to be Aware of' section, where pollen/allergenicity issues are flagged up. In general, species such as birch, alder, ash, plane and lime produce airborne pollen as well as male individuals of dioecious species.

### Biodiversity

Those tree species which have been present in Britain for a longer period (native species), support a wider range of other species. Diversity of tree height within a landscape provides the vertical structure required by many birds. Larger and longer-lived tree species are valuable for nesting and roosting birds and bats as well as fungi and insects.

In urban gardens, the best way to enhance invertebrate biodiversity is to plant a tree, regardless of tree species.

When planting woodlands for biodiversity, the Forestry Commission suggests that the majority of the trees should be native species but can include a proportion of 'honorary natives' and 'advancing native species'. In looking to expand our most important biodiverse woodlands (Ancient Woodlands), native species should be used. In all cases, species should be suited to the site and future climate.

Further detail on this can be found in the Forestry Commission publication '[Managing ancient and native woodland in England](#)'.<sup>123</sup>

### Plant health

The planting of some species of trees, should be avoided due to plant health issues. The planting of ash trees is currently (April 2019) prohibited under the Plant Health Order 2012, which also prohibits all imports of ash seeds, plants and trees and all internal movement of ash seeds,

120 <http://www.righttrees4cc.org.uk>

121 <https://www.myerscough.ac.uk/media/4052/hirons-and-sjoman-2018-tdag-tree-species-selection-1-1.pdf>

122 <http://www.forestdss.org.uk/geoforestdss/esc4m.jsp>

123 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/720995/FCPG201.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/720995/FCPG201.pdf)

plants and trees. Due to the fungal disease *Phytophthora ramorum*, the planting of larch trees in woodlands should be avoided. Corsican pine is very susceptible to *Dothistroma* needle blight and its planting in woodlands should also be avoided – the planting of Corsican pine has been currently (April 2019) suspended within Forestry Commission forests.

The planting of any native black poplars (*Populus nigra* subspp *betulifolia*) should try to use a mix of clones and sexes. The Manchester poplar, so widely planted in the early 1900s, is probably all the same native black poplar clone (Clone 28) and has suffered huge losses due to poplar scab disease. Planting a mix of clones may help reduce the risk of poplar scab or any other pest/disease affecting the population in the future.

### **Existing tree population**

The context of any existing tree population (age structure, species mix, etc.) should also be factored in to the tree selection process. Planting trees of all the same species/clones can limit biodiversity and restrict resilience to pests and diseases. In seeking to avoid monocultures or dependence on a few tree types, the 10, 20, 30 Rule is often applied – whereby an urban tree population should have no more than 10% of a single species, no more than 20% of a single genus and no more than 30% of a single family. BS 8545 2014 states that some studies recommend a lower percentage of any particular species (between 5 and 10%).

## **NURSERY PRODUCTION AND PROCUREMENT**

BS8545:2014 details the different types of nursery production, their advantages and disadvantages as well as the acceptable sizes and forms of tree material for planting.

Nursery stock specification information can also be found in BS3936-4:2007 Nursery Stock Specification for forest trees, poplars and willows, and BS3936-3:1990 Nursery Stock Specification for fruit plants.

Woodland and hedgerow plantings typically use saplings either as bare root or cell grown planted at high densities. For trees in hard landscapes a different approach is needed particularly as space is more limited and the high cost of providing a suitable-sized rootable environment. In these situations, larger-sized stock is more suitable, planted at low density. Planting fewer trees with an improved specification is a better approach than planting many with smaller rooting volumes. Experience in Greater Manchester has suggested that for street tree planting, using stock with a clean stem height of 2.4m reduces the amount of casual vandalism where branches are pulled or snapped off.

For orchard and fruit tree planting, the distance between plants will vary depending on the ultimate size of tree – more vigorous growing rootstocks may need more space than dwarfing varieties.



Biosecurity is one consideration in the selection of suitable nursery. The Urban Tree Manual suggests that nursery selection should favour:

- Trees grown from seed in the UK, or those subject to a period of isolation for one full growing season following importation from abroad.
- Contract growing of stock wherever possible.
- Suppliers that can demonstrate a supply chain audit trail (for example, are part of a recognised Plant Health Assurance scheme) that ensures plant material sourced within the UK is under a regime of biosecurity-aware production and following nationally agreed good practice guidelines.
- Suppliers that demonstrate a combination of all the above.

The Woodland Trust's UK Sourced and Grown (UKSG) initiative for forest industries identifies the provenance of stock to buyers and assures that trees have been raised from seed sourced and grown solely within the UK for the entire lifespan. The Woodland Trust appoints auditors to inspect and approve participating nurseries so that all saplings sold as UKSG are independently audited at every stage of their production. At time of press there are 22 traders on the [WT list](#).<sup>124</sup>

## PLANTING AND ESTABLISHMENT

### Ground preparation

From the site evaluation and assessment, the above and below ground environment should have been assessed and any ground preparation techniques identified. In the street scene, urban planting should consider rooting volume, importation of topsoil and subsoil material, underground modular systems, soil ameliorants, surface opening treatments as well as irrigation and anchorage systems. Future damage to hard surfaces by roots can be avoided by employing appropriate tree and infrastructure-based solutions. TDAG [Trees in Hard Landscapes](#)<sup>125</sup> offers an introduction to this complex subject and further references. Where possible the opportunity for SuDS-enabling tree pits should be considered. This will provide a much-needed source of water for the trees to help them achieve their growth potential, however, provision should be made for taking excess water away to avoid water logging.

An important reference for trees and utilities is the National Joint Utilities Group (2004) [NJUG Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees](#).<sup>126</sup>

For woodland planting, ground preparation techniques may look to reduce compaction, reduce competing vegetation or create a more favourable planting position. Consideration of the wider environment is important in relation to slopes, water courses and erosion.

Rooting volume within urban environments can be restricted. Air and water need to percolate to the tree roots for them to survive and grow. The largest possible rooting volume with good supporting infrastructure should be striven for any given budget. Reducing the overall number of trees in an urban scheme to favour higher-quality plants and bigger/better rooting conditions will promote a better outcome for a given cost.

For information on the specification for topsoil, there are two British Standards: BS 3882:2015 – Specification for topsoil, and BS 8601:2013 – Specification for subsoil and requirements for use.

<sup>124</sup> <https://www.woodlandtrust.org.uk/about-us/what-we-do/we-plant-trees/uk-sourced-and-grown-scheme>

<sup>125</sup> <http://www.tdag.org.uk/trees-in-hard-landscapes.html>

<sup>126</sup> <http://streetworks.org.uk/wp-content/uploads/2016/09/V4-Trees-Issue-2-16-11-2007.pdf>

**Planting depth** – this is important and is partly dependent upon the tree’s method of production. It is noted that many urban trees (highway trees, in particular) have often been planted too deep, so the root flare is below the level of the ground. Avoidance of ground settlement through appropriate soil compaction levels and/or the use of modular structures will help ensure that the tree is planted at the correct depth.

Woodland plantings that use small bare root or container grown stock, can be slot or notch planted (rather than pit planted) but additional care is needed to ensure that plants are at the correct depth and angle.

**Support** – there are different techniques for supporting newly planted trees. Whatever system is used, it should allow stem movement as low down the tree as possible while keeping the roots secured and in contact with the soil. Damage to the tree from rubbing stakes, wires or other securing materials needs to be prevented. Saplings supplied for woodland schemes are generally of a size that do not need support. Fruit trees generally require support when planted – in general, the more dwarfing the variety, the longer the staking will need to be in place.

**Woodland tree protection** – depending on their location and environment, trees may need protection from accidental damage and animal browsing. Protection methods may also serve to make the plants easier to locate and maintain. The presence of deer at a site may mean that taller shelters are used than otherwise. The risk of increased vandalism from installing shelters/spirals needs to be weighed against the level of potential damage from any browsing animals.

Any use of tree shelters or spirals should factor in the cost of maintaining them in the first few years after planting and ultimately their removal and correct disposal. The levels of plastics in our environment is of increasing concern and compostable alternatives should be considered.

For larger areas of woodland planting in more rural locations, fencing may be appropriate and a cost-effective alternative to individual protection. If livestock are to be excluded from the planting area, they will need to be fenced out.

Woodland planting within parks or public spaces that are mown may need measures to prevent accidental strimmer or mower damage. As fencing may not be appropriate here, these areas can be encircled with wooden fence posts at spacings of around 3–5m to help operatives identify where the trees are located and avoid damaging them.

For larger-sized stock planted in grass verges or other grass areas, strimmer guards can also help prevent accidental damage to stem and bark.

**Mulching and mulch mats** – the addition of wood or bark mulch to the ground surface at planting is beneficial. It helps to control weed growth and improve soil structure and moisture. A mulch depth of 50mm to 100mm is effective but it should be kept out of contact with the stem. Annual additions of mulch will be needed to extend the provision of these benefits in the tree’s formative years.

Mulch mats will also help reduce competition from weeds. These can take the form of hessian-type material and will require pinning to the ground typically with pegs. Biodegradable mats and pegs made from natural materials are now available on the market.

### **Community tree planting**

The planting of saplings, fruit trees and smaller-sized standards can be undertaken by volunteers, children and local people so long as they are properly briefed on the task, have the correct tools and are adequately supervised. Volunteers can also get involved with installing stakes, tree shelters and guards as well as mulch mats and woodchip mulch. There are many societal benefits from engaging people in tree planting activities and their aftercare/maintenance. Anecdotal evidence from previous plantings in Greater Manchester suggest that survival rates of community-planted areas is comparable with contractor planting.

## POST-PLANTING MAINTENANCE AND MANAGEMENT

**Weeding** – tree survival and growth after planting can be compromised by competing vegetation. Weeding, whether by hand, chemical, mulch mats or bark/wood chips, should be undertaken in the first three to five years of the tree's life. Pesticide use in forestry is generally declining in response to policies and plans for chemical reduction. The approach taken to this within the UK Forest Standard is:

- Restrict pesticide use to those approved by international agreement
- Seek alternatives to pesticide use
- Confine necessary usage to the absolute minimum

**Watering** – trees in the urban environment, or those of large stock size, may also require watering over the establishment period. Frequent applications of water are better than larger, single watering. Guidance in BS 4585 2014 on the amount and timing of watering suggests that watering twice a week with 20 litres of water is adequate to keep an 800mm diameter root ball well irrigated. For the first growing season, all the moisture the tree will access will be from inside the soil root ball. A soil moisture meter can be used to assess the need for irrigation. Watering of large stock trees is likely to be at least three full growing seasons.

**Formative pruning** – throughout the early years of the trees' life formative pruning should be carried out in accordance with BS 3998 and BS 4585. This involves removing branches that may cause significant problems or defects in the future.

**Monitoring and ongoing maintenance** – regular checks on recently-planted trees should include foliage/shoot health, condition and function of stakes, ties, shelters and weed control methods. Where stakes, shelter, supports, etc. are no longer needed, they should be removed and disposed of appropriately. There are also more technical methods of assessing tree health available – leaf fluorescence and leaf chlorophyll content tests. A visual check for pest and diseases can also be carried out alongside other maintenance activities.

For woodland plantings, beating up (replacement of failed trees) should be carried out in the winter following an assessment of survival rates in the previous summer.





## TREES IN HARD LANDSCAPES

For street trees, the urban environment is challenging above and below ground. The **TDAG Trees in Hard Landscapes**<sup>127</sup> document explores these challenges in the chapter 'Technical Design Solutions'. The specialists engaged with any street tree planting project should include amongst others local authority tree, planning, disabled access and highways officers, engineers, security and public safety staff and the police. Residents, user groups and businesses may also need to be consulted.

### Site assessment

Key constraints:

- Street furniture including street lighting columns
- Pavement widths / drop kerbs
- Parking bays
- Bus pull-ins
- Metrolink overhead power lines
- Underground services
- Proximity to traffic lights, CCTV, signage and visual splays at junctions
- Cantilevered buildings/overhanging structures
- Entrances to buildings/fire exits
- Obscuring important architectural building detail.

### Services

When you are proposing to plant trees on pavements it is crucial that you understand where the underground services are located. This will help you determine the viability of your planting proposals and how to tailor your tree pit specification so that there is sufficient space to accommodate both existing services and the tree.

Your starting point should be to source service plans from the utility providers as this will give you a good idea of where services should be located, however, these plans can be inaccurate as services are not always installed to the depth and location required by the Highways Authority and the utilities provider.

Ground Penetrating Radar is another good mechanism for identifying where services are located but the accuracy can be affected by moist, heavy clay soils or where there are barriers such as reinforced concrete.

To be absolutely certain of the location and type of services found under the pavement it is recommended that a trial hole/slit trench is dug across the paved area.

### Trial holes

The dimensions of the trial hole will be determined by the width of the pavement. The wider the pavement the longer the trial hole you might want to dig to find the best location to plant your tree, i.e. where there are fewest services.

The length of a trial hole will be determined by the width of the pavement but as a minimum the length should be no less than 1.3m from the kerb edge towards back of pavement.

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127 <http://www.tdag.org.uk/trees-in-hard-landscapes.html>

Trial holes should be at least a meter deep, the depth required to provide sufficient growing medium for your tree plus the accompanying modular structures and a drainage layer. The trial holes also need to be wide enough to allow for safe and practical hand digging by an operative.

A GMRAPS permit will be required for working on the highway. The contractor will need to supply the local authority highway's department with evidence of the required insurance cover, working method statement, traffic management plan, H&S plan and proof of NRSWA accreditation for working on the highway. For further information on GMRAPS visit [www.gmraps.org](http://www.gmraps.org).

Excavation work should be carried out carefully and follow recognised safe digging practices as set out in the Health and Safety Executive HSG47 guidance; [www.hse.gov.uk/pubns/books/hsg47.htm](http://www.hse.gov.uk/pubns/books/hsg47.htm).

Contractors will also need to Install 'Chapter 8' barriers and signs to separate the area of working from pedestrians. For guidance visit [assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/203669/traffic-signs-manual-chapter-08-part-01.pdf](http://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/203669/traffic-signs-manual-chapter-08-part-01.pdf).

When digging your trial holes any services encountered will need to be recorded as follows:

- Utility type – i.e. electricity, gas, water or telecoms
- Distance from front of trench to the start of the service
- Diameter and depth of service – i.e. measurement to top and bottom of service from the surface (excluding the depth of the overlying pavers or bitmac material)
- Photographs showing the location of the service in the trial hole and the direction in which it is running

Following the completion of the dig, the hole will need to be backfilled and reinstated to the standard that existed before digging. The Highways Authority should then be informed of the completion works so that they can inspect the level of reinstatement.

Once all of the services data has been collected a cross section and plan view of the highway should be produced showing the service type, depth, distance from the inside road kerb edge and dimensions.

The diagram below shows a typical trial pit drawing with plan and section views, utility data and supporting photographs.

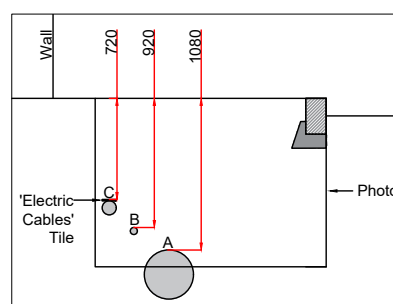
#### EXAMPLE TRIAL HOLE SPECIFICATION



Location Plan NTS



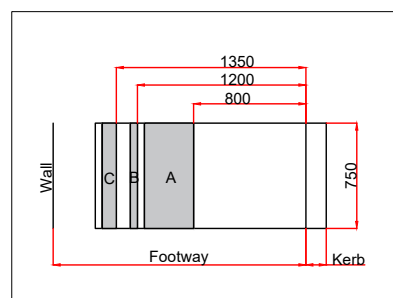
Photo of trial pit



Section NTS

Trial Hole No HIL1902/3 - 05/07/19			
Ref.	Description	Service	Utility
A	350Ø Duct	Sewer	Unknown
B	50Ø Duct	Water	Unknown
C	Tile on top 100Ø Duct	Electric	Unknown

<p>Note:</p> <p>All dimensions are in millimeters unless stated otherwise.</p> <p>Dimensions on plan are taken from inside of kerb.</p> <p>Plans and sections are not to scale.</p>			
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Plan NTS

## Soil

In soft landscaping areas the medium used to backfill the planting hole should be as close as possible in texture and structure to the soil excavated. Unless the ground contains a high level of inert material, the soil dug from the excavated hole should be used as the backfill medium. For pavements, the material that provides the load-bearing structure is frequently inert with very little organic content. There will therefore normally be a requirement to import soil which should comprise as follows:

- From the bottom of the tree pit to approximately 30/40 cm of the soil horizon from the top a freely draining subsoil, according to BS8601:2013
- The top 30/40cm of the soil horizon should be a sandy loam, 'multipurpose' topsoil, according to BS3882: 2015
- Mix in biochar 5% by volume to the topsoil layer

## Avoiding compaction

For trees planted in pavements, avoiding soil compaction is essential to ensure that water and oxygen can freely move to the rooting zone. Modular systems although more expensive than structural soils have the benefit of being able to support overlying paving structures whilst hosting soil with a good organic content and preventing compaction. Structural soils can be over compacted during installation and the organic content is generally much lower.

A drainage layer is also an important component of a good tree pit design as it will help to reduce the potential for water to pool, which can lead to anaerobic conditions forming in the rooting zone. Where drainage is a problem due to impermeable material below the base of the tree pit a perforated underdrain can be installed to take any excess water away to the nearest sewer. Consent/advice should be sought from the water treatment company and the highways authority.

## Large rooting area

Trees planted in an urban environment frequently do not achieve their full growth potential and there are several reasons for this of which rooting volume/tree pit, size is significant. Wherever possible large tree pits should be constructed to provide room for sustainable root growth.

## Access to air and water

The roots of trees need a good supply of water and oxygen which can be achieved by using:

- Irrigation systems
- Permeable paving
- Aeration inlets

During the establishment period, watering is important and should be carried out for the first three years as a minimum.

## Good tree specimen

**Size** – to achieve a good impact and to improve resilience from accidental damage or vandalism the tree should be a minimum of 18/20cm girth but preferably 20/25cm girth. Using stock with a clear stem height of 2.4m reduces the amount of casual vandalism where branches are pulled or snapped off.

**Condition** – ask the developer to supply images of the actual trees they are proposing to plant to help determine if they are of a good form, size and condition. Tagging trees at the nursery is always advised.

**Biosecurity** – disease is becoming an increasing issue in the UK. Ask the developer to demonstrate that the supplier has a biosecurity system in place: <https://www.hillier.co.uk/policies/biosecurity-policy>.

## Right tree in the right location

The tree species selected should be appropriate in terms of:

- The space that is available to grow into



- Ability to cope with limited water availability and salt
- Low levels of light if adjacent new build is going to cause shade limiting access to sunlight
- Vulnerability to wind from canyoning caused by tall buildings and dense massing
- Ability to cope with light reflection if associated with new build where glass is a prevalent material
- Clear stemmed to avoid coming in to contact with pedestrians or vehicles

If in any doubt, please ask the local authority tree officer for advice.

### Protection

Some form of temporary tree guard should always be used during the establishment period.

Installing a temporary weldmesh guard (supported by stakes) affords protection in the trees' first years after planting. The use of the guards needs to be carefully considered against the potential accidental damage to and from passing vehicles and their doors when opened. Maintenance of the guards, and their removal when the trees has established and grown, will need to be factored in to any aftercare programme.

### Establishment/aftercare

Newly-planted trees should benefit from at least three but preferably five years aftercare.

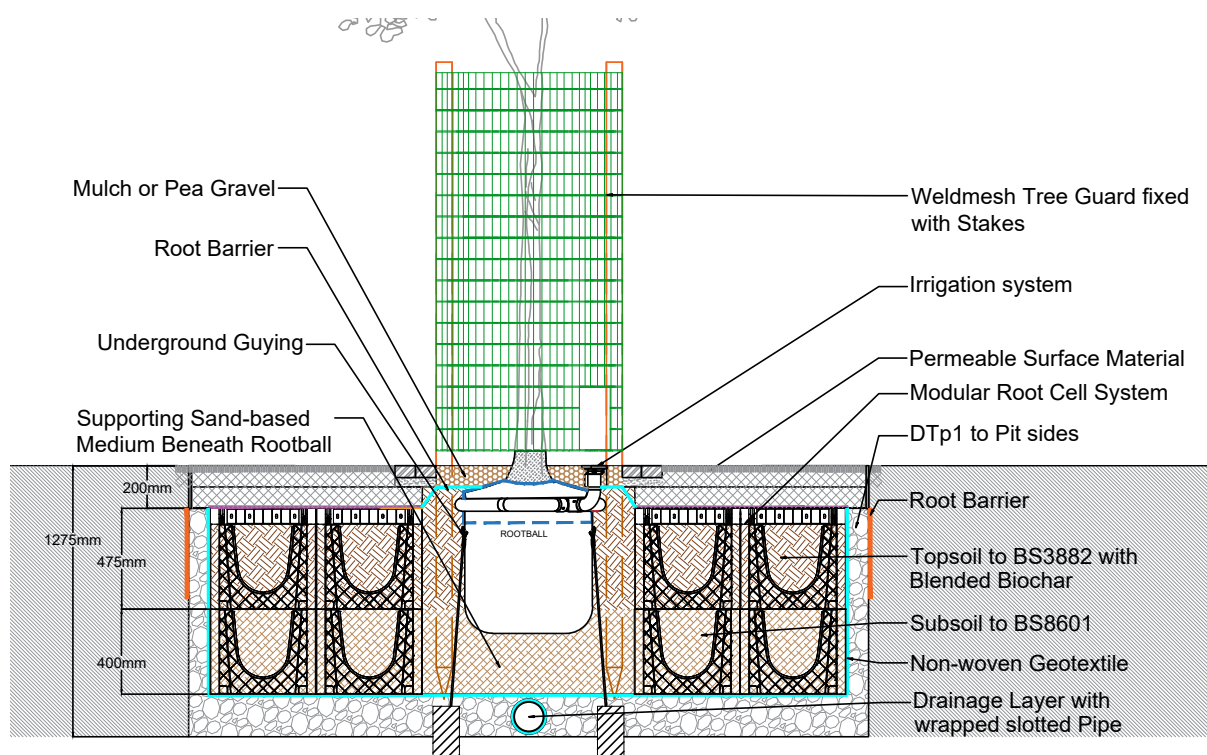
This should include:

- Regular watering during hot dry weather
- Loosening ties as the tree grows
- A feed before handover to the local authority
- Re-strapping if signs of the tree catching the guard
- Pruning low-hanging (on streets) or damaged branches

### Tree pit components

The drawing below is not meant to be used as a guide with respect to appropriate tree pit dimensions. However, the infrastructure it contains combined with a good rooting volume will help to create the conditions needed for sustainable tree growth.

**TREE PIT DETAIL – HARD LANDSCAPES – AFTER PGLA LANDSCAPE ARCHITECTS**



## OTHER GUIDANCE AND INFORMATION

### PLANTING GUIDES

City of Trees has produced a number of [planting guides](#)<sup>128</sup> from fruit trees to garden trees as well as publishing a [How to Establish a Community Orchard](#)<sup>129</sup> guide.

The Woodland Trust has produced a [Planting your own trees – help and support for landowners](#)<sup>130</sup> guide.

### ORCHARD PLANTING

The Orchard Project has a series of [practical guides](#)<sup>131</sup> from planning to planting a community orchard.

Natural England has produced a technical note on [Traditional orchards: planting and establishing fruit trees](#)<sup>132</sup>.

### HEDGEROW PLANTING

The Royal Horticultural Society has [guides](#)<sup>133</sup> on different aspects of hedge management and planting, aimed more at the garden scale of working.

The Mersey Forest has produced a [How to Plant and Maintain Hedgerows](#)<sup>134</sup> guide.

## 4.4 ASSESSING THE VALUE OF OUR TREES AND WOODLANDS

As our city region develops and grows, some of our existing trees will inevitably be lost to make way for new buildings and infrastructure. Where such losses occur, planning authorities will usually require some level of mitigation planting. Replacement trees may take decades to mature and as landscapers tend to favour smaller ornamental trees, may never deliver the same level of benefit as large old trees they replace.

Building on the Government's 25 Year Environment Plan, the Environment Bill provides the framework to mandate 'biodiversity net gain'. Biodiversity net gain requires developers to assess the type of habitat and its condition before submitting plans, and then demonstrate how they are improving biodiversity – such as through the creation of green corridors, planting more trees or forming local nature spaces. Green improvements on site would be encouraged, but in some circumstances where they are not possible, developers will need to pay a levy for habitat creation or improvement elsewhere.

To ensure that we retain the benefits that trees provide, and remain resilient, even as we grow, it will be important to minimise the numbers of mature trees lost through development and to ensure that replacements are agreed up to at least the equivalent benefit, rather than according to a simple numeric replacement (e.g. two for one). To achieve this, landowners and developers should undertake a valuation of any trees on development sites.

There has been global adoption of new concepts, such as ecosystems services, natural capital and natural capital accounting, which are reflected in planning policy and statistical reporting throughout the UK.

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128 <http://www.cityoftrees.org.uk/resource/planting-guides>

129 [http://www.cityoftrees.org.uk/sites/default/files/CotHowToCommOrchV2\\_0.pdf](http://www.cityoftrees.org.uk/sites/default/files/CotHowToCommOrchV2_0.pdf)

130 <https://www.woodlandtrust.org.uk/plant-trees/advice>

131 <https://ptes.org/campaigns/traditional-orchard-project/orchard-practical-guides/>

132 <http://publications.naturalengland.org.uk/publication/26001>

133 <https://www.rhs.org.uk/advice/garden-features/hedges>

134 <https://www.merseyforest.org.uk/howtoguides/hedgerow.pdf>





Situations where valuation is important:

- **Protection** – valuation used to establish a balanced benefits assessment of tree removal and deter avoidable loss.
- **Compensation/mitigation** – valuation used to secure commensurate replacement or payment for removal or damage to trees.
- **Design** – valuation used to compare design options and articulate design outcomes to a wider audience.
- **Management** – valuation used to enhance expenditure planning and collaboration for Green Infrastructure delivery.

This Tree and Woodland Strategy has been prepared using **i-Tree Eco**<sup>135</sup> to develop a valuation model of Greater Manchester's total tree and woodland resource. But there is also a growing range of practitioner tools available to measure the value of Green Infrastructure to suit a range of scenarios and scales. A short appraisal of each is considered in TDAG's First Steps in Valuing Trees and Green Infrastructure<sup>136</sup>.

AFTER JALUZOT, A. AND FERRANTI, E.J.S. FIRST STEPS IN VALUING TREES AND GREEN INFRASTRUCTURE. 2019.

A Trees and Design Action Group (TDAG) Guidance Document. UK: London.

Table 1 <b>Tools to consider: a short selection</b> <sup>10</sup>	Type of green asset	Valuation objective(s) supported				Strengths	Limitations
							
<b>Council of Tree and Landscape Appraisers (CTLA) methods</b> More information: <a href="#">Link</a>	Individual trees	●	●			Values trees as private assets, using <i>cost of equivalent replacement (COR)</i> . Useful in common law cases and private tree disputes. Provides basis of structural value in i-Tree in USA.	Does not reflect public amenity value, community benefits or ecosystem services. Expert input needed.
<b>Capital Asset Value for Amenity Trees (CAVAT)</b> Full method More information: <a href="#">Link</a>		●	●	●		Values trees as public assets, using <i>COR</i> approach. Reflects relative contributions to public amenity. Uses include planning for development and compensation for damaged or destroyed public trees.	Does not reflect value as private asset or directly estimate annual or accrued ecosystem services. Expert input needed.
<b>Capital Asset Value for Amenity Trees (CAVAT)</b> Short method More information: <a href="#">Link</a>	Tree population				●	Values tree populations as public asset, using stripped down <i>COR</i> approach. Enables strategic management of public tree stock.	Not suitable for single trees. Expert input not required, but familiarisation with the tool needed.
<b>i-Tree Eco</b> More information: <a href="#">Link</a>		●		●	●	Useful to communicate benefits of trees and for strategic management. Includes annual and accrued ecosystems services and structural value based on CTLA (as default) or CAVAT (optional) methods.	Not suitable for single trees, planning for development or for compensation. Many ecosystems services not currently reflected. Expert input needed.
<b>Benefits of SuDS Tool (W045 BeST)</b> More information: <a href="#">Link</a>	Wider range of green assets	●		●	●	Intended for sustainable drainage schemes. Provides assessment across a multiple ecosystems services.	Expert input not required, but familiarisation with the tool needed.
<b>Greenkeeper</b> Available from Sept. 2019. More information: <a href="#">Link</a>		●		●	●	Intended for parks and accessible green spaces. Provides assessment of health, wellbeing, amenity, carbon sequestration and air pollution removal. Easy to use by non-expert.	No user feedback yet available.
<b>Green Infrastructure Valuation Toolkit (GI-VAL)</b> More information: <a href="#">Link</a>		●		●	●	Provides assessment across a multiple ecosystems services. Useful for design.	Expert input not required, but familiarisation with the tool needed.
<b>Natural Capital Planning Tool</b> More information: <a href="#">Link</a>		●		●	●	Provides assessment across a multiple ecosystems services. Easy to use by non-expert. Useful in design and planning contexts.	Outputs are impact scores rather than monetary figures.

<sup>135</sup> <https://www.itreetools.org/tools/i-tree-eco/i-tree-eco-overview>

<sup>136</sup> Jaluzot, A. and Ferranti, E.J.S. First Steps in Valuing Trees and Green Infrastructure. 2019. A Trees and Design Action Group (TDAG) Guidance Document. UK: London.



# ALL OUR TREES

## GREATER MANCHESTER'S TREE AND WOODLAND STRATEGY

**“If not us, who? And if not now, when?”  
—John F Kennedy**

“The indisputable evidence detailed in this document shows the crucial importance of our existing tree resource for the air we breathe, the homes we live in and the world in which we inhabit.

We can no longer see trees and woods as ‘nice to have’ – they are a crucial part of a vibrant, climate resilient and thriving city region.

The data demonstrates why we need to plant more trees – growing the urban forests of the future – but also shows that we must preserve and protect what we have. Big really is beautiful – and larger, leafier species enable us to reap the rewards.

So we not only have the ‘why’, but the ‘where’ – the detailed mapping illustrates the best places to plant to maximise the benefits: the right tree in the right place.

Greater Manchester has a unique opportunity to be at the forefront of this ‘green revolution’ – and the time is now.

We all need to work together to protect the trees that we have, and plant more for future generations. These are, after all, All Our Trees.”

**—Jess Thompson, Director, City of Trees**



Manchester  
City of Trees