

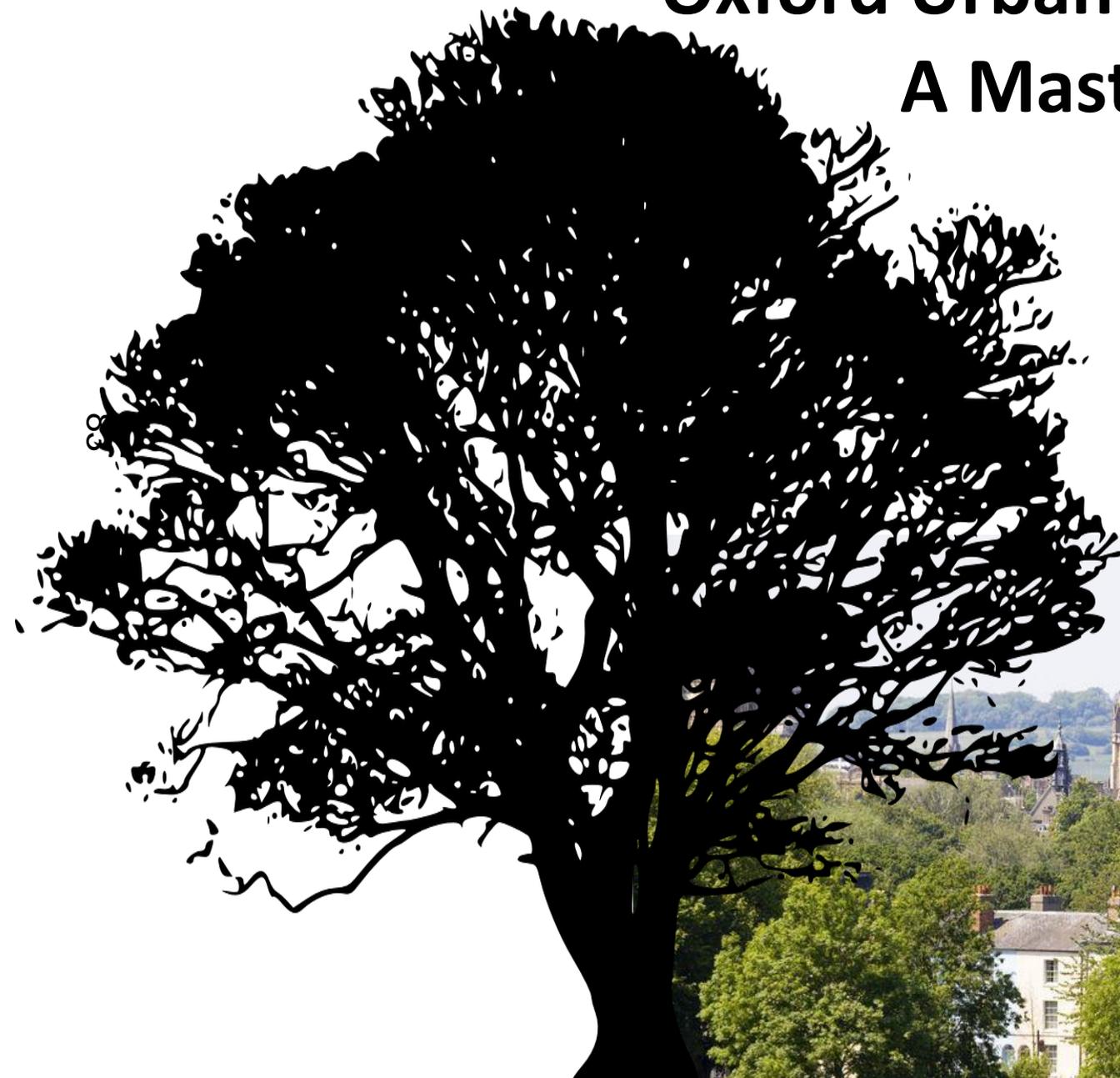
Appendix 1

Oxford Urban Forest Strategy

A Master Plan to 2050

SEPTEMBER 2021

www.oxford.gov.uk



Appendix 1

Contents

Contents.....	2
Foreword.....	4
Executive Summary.....	5
1. Introduction	7
1.1. What does the strategy cover?	9
1.2. Oxford City Council partners and stakeholders	10
1.3. Plans, policies, influencing strategies.....	11
2. Oxford’s Urban Forest Strategy	12
2.1. Vision, aims and objectives	12
3. Oxford’s Urban Forest.....	13
3.1. Canopy cover data.....	13
3.2. Treescapes.....	16
4. Ecosystems Services and the Value of our Urban Forest	19
4.1. Physical and mental health and wellbeing.....	19
4.2. Urban Heat Island effect	19
4.3. Air quality and emissions	20
4.4. Community cohesion and engagement	21
4.5. Biodiversity.....	21
<i>Native vs non-native</i>	21
4.6. Flood control and water quality.....	22
4.7. Carbon storage	23
4.8. Landscape character, heritage and culture.....	23

<i>Notable trees</i>	24
4.9. Economic benefits and tourism	25
5. What can we learn from our data?	27
5.1. Deprivation.....	27
5.2. Nature Recovery Network (NRN).....	30
6. Threats to Oxford’s Urban Forest.....	32
6.1. Climate change.....	32
6.2. Lack of diversity and biosecurity.....	32
6.3. Ageing or declining tree population	32
6.4. Increase in urban development or inappropriate development.....	32
7. Right Tree, Right Place	34
8. Objectives and Principles for Planting.....	36
Protect, Improve and Manage.....	36
Objective 1 – Manage our existing tree and vegetation resource according to best practice and improve vegetation health	36
Objective 2 - Improve biosecurity and manage ash dieback and other pests and diseases according to best practice	36
Expand, Enhance and Develop	37
Objective 3 - Increase urban forest canopy cover using the right tree, right place principle	37
Objective 4 – Increase resilience through greater urban forest diversity	38

Appendix 1

Objective 5 – Prioritise areas where new tree and other vegetation planting benefits can be maximised.....	39
Objective 6 – Improve biodiversity and contribute to nature recovery areas.....	40
Objective 7 - Conserve and enhance landscape character.....	40
Engage, Promote and Employ.....	41
Objective 8 - Engage with communities and key stakeholders ...	41
Objective 9 – Understand the value of our urban forest and create opportunities to reap economic benefits from it.....	41
9. Implementation	43
9.1. Tree management and responsibilities.....	43
9.2. What’s already going on?.....	43
9.3. Funding.....	44
9.4. Monitoring and Review	44
9.5. Delivery and next steps	44
Appendix 1 Plans, Policies, Guidance and Influencing Strategies	45
Appendix 2 - Who is responsible for our urban forest?	47
References	48

85

Thank you to all of the organisations for their help in developing this strategy. Particular thanks to the Oxfordshire Treescape Opportunity Mapping Project, Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT), Wild Oxfordshire, Oxford Direct Services, Environmental Change Institute and Earthwatch Institute.

Appendix 1

Foreword

2020 and 2021 have been years of unparalleled loss and uncertainty. Until the rollout of the vaccines is complete, we will not truly be through this crisis, but now is the time to draw breath and plan for a healthier, greener, and fairer city, and that means putting a richer natural environment at the heart of all neighbourhoods.



Councillor Tom Hayes planting an Earthwatch "Tiny Forest" in Foxwell Drive

Oxford's communities have been responding to the challenges of the pandemic by showing ever greater partnership and innovation. Now is the time to nurture the new collaborative ways of working, and the new way of viewing the city as interconnected (of people, and of people and planet). This will be especially important not only to

respond to the crises which exist today (the pandemic and climate change) but also those which will surely follow (pandemic-related social, economic, racial, and health inequalities). By creating community action to enhance our natural environment, we can create new belongings to people and place, but as critically, tackle inequality and deprivation.

In respect to biodiversity, are we truly meeting the climate emergency that we declared unanimously as a City Council and the ecological emergency that we face? With the potential for trees to cool our streets, enhance our wellbeing, and meet the climate crisis

we face, we must increase our on-street canopy cover and urban forest generally in proportions equal to the demanding expectations of our climate emergency motion and the scale of the crisis we face.

We committed to do everything in our control and influence to deliver against the challenges laid out by the scientific community. By locking in carbon, trees and other green infrastructure represent an important contribution to the Council's ambitious targets to reduce its carbon emissions to zero by 2030 and deliver a Zero Carbon Oxford by 2040.

Investing more in Oxford's largest ever street and parks tree planting programme and pledging to work with community and third-sector organisations to plant more, will be yet another example of the seriousness with which this Council treats our responsibilities to Oxford's current and future residents. I want to thank all those organisations and partners which have contributed to this Strategy.

Oxford's carbon emissions amount to nearly 10 times the total carbon storage of Oxford's urban forest. We need to do more and this Strategy seeks to do more and to do it for the whole of the city.

Councillor Tom Hayes

Deputy Leader and Cabinet Member for Green Transport and Zero Carbon Oxford at Oxford City Council

Appendix 1

Executive Summary

This strategy seeks to set a direction for Oxford, as a city, to protect and manage, grow and expand our urban forest to help tackle the climate and ecological emergencies that we face. It's a long term master plan to 2050 which sets a framework for action.

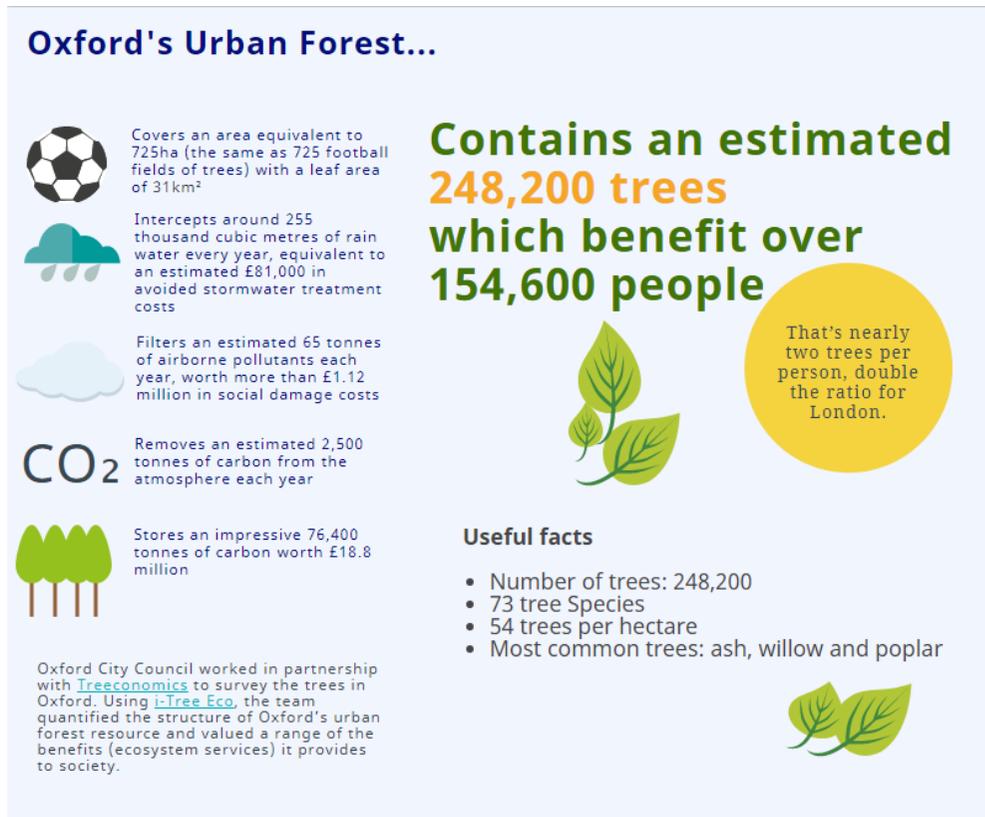
Our urban forest is made up of all the trees and woody vegetation in our city and provides us with numerous benefits, also known as ecosystem services, such as clean air and carbon storage.

The vision for our urban forest is for it to support the city to address and adapt to climate change and habitat loss whilst conserving and enhancing its distinctive character. Regardless of income and postcode, all communities will be able to thrive in nature where they live, and feel pride in Oxford as a liveable city that is healthy, biodiverse, resilient and beautiful.

This strategy follows the principle of “right tree, right place” and seeks to ensure high quality planting in order to maximise benefits for nature and for people.

Objectives are set out into 3 parts:

- Protect, Improve and Manage
- Expand, Enhance and Develop
- Engage, Promote and Employ



The strategy is for the whole city and we need the council, citizens, and communities to work together to deliver the aims of the strategy if it is to have the greatest impact.

External funding opportunities will be sought to get resources to develop detailed planting and engagement plans with key stakeholders and partners to help achieve the objectives of this strategy.

Appendix 1

Appendix 1

1. Introduction

In response to rising concern about the urgent need for action, on 28 January 2019 Oxford City Council unanimously declared a climate emergency and provided for a Citizens' Assembly on Climate Change¹. Oxford became the first UK city to hold a Citizens' Assembly on Climate Change in September and October 2019.

90% of the randomly selected representative sample of 50 Oxford residents that made up the Citizens' Assembly responded to the key question asked of them and felt that Oxford should aim to achieve 'net zero' sooner than 2050. There was also widespread belief that Oxford should be a leader in tackling the climate crisis.



David Attenborough mural on East Oxford Games Hall

Biodiversity was a key theme considered by the Assembly. Assembly members were presented with visions of possible futures for Oxford, each listing a series of co-benefits and trade-offs. Taking specific actions to address climate change, such as proactively putting in measures to protect and expand our urban forest, provides us with co-benefits. This means that not only do we tackle the climate emergency but we also improve health and wellbeing, the economy and our environmental quality. The Assembly opted for the most ambitious biodiversity vision which represented the greatest change to the way people live now. Addressing climate change and habitat loss as an emergency means we recognise that we need to accelerate our plans.

Our natural environment, including our trees and forests, play an important role in reducing the effects of climate change and supporting our biodiversity. They provide us with ways to adapt to it through the ecosystems services they provide such as carbon capture, reducing flooding, giving us clean air and supporting our health and wellbeing. They can provide us with beautiful environments that create a sense of place that should be accessible to everyone. But most important of all, they are sanctuaries that connect us to the natural world and for that we need them to be cherished.

Oxford's total canopy cover, including trees and shrubs is similar to that of London. It is quite high compared to other cities like Bristol or Glasgow. This Urban Forest Strategy celebrates our forest resource and the benefits it brings and provides for it to be protected, enhanced and expanded for everyone now and for generations to come. This strategy must be seen in the wider context

Appendix 1

of the significant changes needed in our society to reduce our carbon emissions and the global, national and local plans to achieve net zero², as well as the need to reduce air pollution and protect public health.

With greater awareness of climate change, tree planting has become increasingly popular. However, planting the right trees in the right places is essential. Planting trees on important habitats like wetlands or species-rich grasslands will harm our natural environment by destroying these rarer habitats. In addition, these types of habitat often sequester more carbon than trees so planting trees is not always the best solution.

This strategy follows the principle of “right tree, right place” and seeks to ensure high quality planting in order to maximise benefits for nature and for people.

The strategy seeks to protect and enhance the beauty of Oxford by taking account of Oxford’s distinctive landscape character and its relationship to the built environment.

The strategy is for the whole city, not just city council land. The council’s remit includes the management of city council land and our public parks, tree protection orders and formulation and implementation of planning policy. The council also has an important leadership and influencing role. However, the vast majority of our urban forest, and where there is potential for expanding it, is on private land and out of the council’s direct control. For example, 19%

of the city’s land use is private gardens. This presents a great opportunity for planting. We need residents, private land owners and our communities, businesses and institutions to work together, as a city, to deliver the aims of the strategy if it is to have the greatest impact.

Empowering communities and people to enhance our urban forest and our biodiversity will help to create zero carbon citizens. Where our urban forest and our biodiversity is enhanced in deprived parts of Oxford, and where citizens on lower incomes are playing a leading role, this strategy will help to develop a fairer, more inclusive city.

The strategy seeks to do three things: protect what we have – **Protect, Improve and Manage**, expand what we have - **Expand, Enhance and Develop** and engage people in the process - **Engage, Promote and Employ**. This framework acknowledges that our existing trees are just as important as planting new trees and that engagement is going to be fundamental to achieving the aims of the strategy.

The strategy has been developed taking inspiration and guidance from a number of sources including: The Greater Lyon Tree Charter³, the Woodland Trust⁴ and the invaluable resources produced by the Trees and Design Action Group (TDAG)⁵. The strategy will complement existing City Council strategies such as the Green Spaces Strategy and the City’s Biodiversity Action Plan. The approach of this strategy has been aligned with Oxfordshire County Council’s emerging tree strategy.

Appendix 1

1.1. What does the strategy cover?

The strategy is about our urban forest which is not just trees but also includes other woody plant vegetation, such as shrubs and hedgerows, which are fundamental to the forest ecosystem and the ecosystem services they deliver.

Ecosystem Services are the benefits people derive from ecosystems such as clean air, raw materials, flood protection and spaces for recreation.

To get a sense of how important our urban forest is, imagine an Oxford without any trees. The negative impact on mental and physical health, quality of life, desirability as a place to live and work, and as a place for tourism, recreation or shops and services would be huge.

Our urban forest is part of our Green Infrastructure. Green Infrastructure is a term that is defined in national planning policy and refers to planned networks of green spaces (such as parks and woodlands) and green features (such as street trees) that provide quality of life and environmental benefits. Thinking of these green spaces as infrastructure recognises that our green spaces can help deliver wider planning policy and is integral to creating sustainable communities.

In 2015 Oxford City Council commissioned Treeconomics to undertake a canopy assessment and subsequent iTree Eco



assessment of our urban forest resource. From this work, we have a good understanding of our canopy cover, species make up, health of our trees and its distribution. We also have an understanding of the value of the ecosystems services that our urban forest provides.

This strategy sets out a vision, aims and a set of 9 objectives which seek to ensure that our existing forest resource is managed effectively and to set principles as to where new planting should take place.

The strategy links to the tree opportunity maps produced by the Oxfordshire Treescape Opportunity Mapping Project. These maps will help to guide where tree planting will have the maximum

Appendix 1

benefits in relation to particular ecosystem services. The maps have identified that there are opportunities for planting within areas designated as a Nature Recovery Area that would contribute to protecting and enhancing our biodiversity and in the most deprived areas of Oxford which will help to improve the quality of life for communities in these areas.

The principal output will be to develop a detailed planting and engagement plan with partners and key stakeholders that reflect the principles established in this strategy. The strategy will be reviewed every 10 years. This gives us time to see more change as trees have had time to grow.

The strategy is intended to set a strategic direction for the city as a whole, including approaches to tree planting on private land. It is not intended to cover detailed aspects of tree management such as risk and liability issues or interpret existing planning policy which is covered elsewhere.

1.2. Oxford City Council partners and stakeholders

Oxford City Council has a strong focus on partnership working. The City Council will work with the Zero Carbon Oxford Partnership⁶ (ZCOP) that it has established to help deliver the strategy, along with many others. The aim of ZCOP is to provide a forum for major organisations and employers based in and around Oxford to work together to help the city achieve net zero by 2040—ten whole years ahead of the UK's national target of 2050. In order to provide a holistic approach the scope extends beyond emissions reduction and includes nature and biodiversity. The core members include major local institutions, businesses and organisations such as BMW, the

Universities, both NHS Trusts, LandSec, SSEN, Unipart, and Oxfordshire County Council.



Florence Park

Alongside the Zero Carbon Oxford Partnership are other stakeholders and partner organisations fundamental to the development and delivery of this strategy.

These include organisations dedicated to advocating for our natural environment and helping our communities to join together and take action such as:

- Oxfordshire Treescape Opportunity Mapping Project
- Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT)
- Wild Oxfordshire

Appendix 1

- Oxford Direct Services
- Oxford Green and Blue Spaces Network (GBSN) members
- Oxford Preservation Trust
- Thames Valley Environmental Records Centre
- Community Action Groups (CAG) Network
- Environmental Change Institute
- Oxford Civic Society
- Earthwatch Institute Europe

Oxfordshire Treescape Opportunity Mapping Project

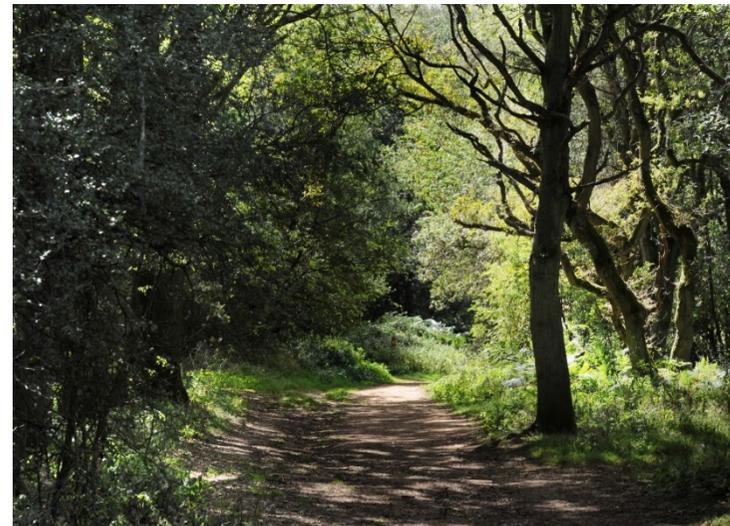
The Oxfordshire Treescape Opportunity Mapping Project is a project that is part of the campaign to double tree cover in the UK. Led by the Lord Lieutenant of Oxfordshire, the project is working to create a tree planting opportunity map for Oxfordshire to show where tree cover might be increased. This mapping project seeks to provide a clear land use plan which helps to ensure that the right trees are planted in the right places. The project uses an ecosystem services approach and is intended to be used to help form public policy and strategies and to guide individual plantings. Initial mapping undertaken for Oxford city has been used to inform this strategy. More information about the project can be found here: <https://www.oxtrees.uk/>

The rising awareness of climate change and climate and co-benefits of biodiversity enhancement will lead to new groups, communities, and innovations being tried out. The Council will seek to support new organisations and communities to engage with this strategy. Nevertheless, trees are a matter for all citizens and with most of Oxford's residents having gardens, and many businesses and other

organisations having grounds, there is a real opportunity for individual action that can make a very real difference – and this is also a key part of our strategy.

1.3. Plans, policies, influencing strategies

The Oxford Urban Forest Strategy is based on best practice and national guidance. It has links to and supports the aims of a number of other local strategies, policies and planning documents. For example, this strategy covers elements of biodiversity, but it is not a replacement biodiversity strategy for the city. It must be viewed in conjunction with other relevant biodiversity strategies and biodiversity legislation. Relevant complementary strategies, policies and guidance are listed in Appendix 1.



Shotover Country Park

Appendix 1

This will be achieved through the following objectives:

Protect, Improve and Manage

1. Manage existing tree and vegetation resource according to best practice and improve vegetation health
2. Improve biosecurity and manage ash dieback and other pests and diseases according to best practice

Expand, Enhance and Develop

3. Increase urban forest canopy cover using the right tree, right place principle
4. Increase resilience through greater urban forest diversity
5. Prioritise areas where new tree and other vegetation planting benefits can be maximised
6. Improve biodiversity and contribute to nature recovery areas
7. Conserve and enhance landscape character

Engage, Promote and Employ

8. Engage with key stakeholders, communities, businesses and other organisations, and citizens - particularly residents living in deprived parts of Oxford which especially stand to gain from an enhanced Urban Forest
9. Create opportunities to reap economic benefits from our urban forest

2. Oxford's Urban Forest Strategy

2.1. Vision, aims and objectives

Oxford's Urban Forest will support the city to address and adapt to climate change and habitat loss whilst conserving and enhancing its distinctive character. Regardless of income or postcode, all communities will be able to thrive in nature where they live, and feel pride in Oxford as a liveable city that is healthy, biodiverse, resilient and beautiful.

94

The strategy aims to:

- maintain and enhance Oxford's Urban Forest to secure its biodiversity value and the ecosystem services which flow from it
- ensure our urban forest plays a role in the city addressing and adapting to climate change and other challenges
- create a healthier place for people in nature and provide a richer biodiversity in deprived parts of Oxford
- engage and involve all communities and citizens

Appendix 1

random point sampling and has produced estimates for each ward and for the city as a whole.

- **Treeconomics iTree ECO**

In 2017 Oxford City Council commissioned Treeconomics to undertake a further assessment of our urban forest using their i-Tree ECO methodology. This methodology includes undertaking a “bottom-up” survey of trees within the city using sampling plots. It provides information on the structure and composition of the urban forest, such as species, size and age, and allows the benefits of our urban forest to be quantified and valued. For example, how much carbon is stored or how much pollution is removed from our air. The full report is available to view on the City Council’s website.⁸

- **BlueSky Data from Oxfordshire Treescape Opportunity Mapping Project**

This data, from 2015, uses aerial imaging and maps actual trees and their size rather than using sampling methods as i-Tree does. This data is likely to be more accurate. The BlueSky data is being used by the Oxfordshire Treescape Opportunity Mapping Project.

i-Tree data showed that our total Canopy Cover is 22.3% (this includes shrubs as well as trees) and that our Tree Canopy Cover is 15.9%. The BlueSky data shows that our Tree Canopy Cover is likely to be slightly higher at 17.1%. This data is a more accurate measure of canopy cover and we will use this as the basis for analysis going

3. Oxford’s Urban Forest

Oxford’s urban forest is made up of trees and woody vegetation, such as shrubs and hedgerows. It provides Oxford’s residents and wildlife with a huge range of benefits. However, for many people the most critical role that our urban forest plays is enhancing their enjoyment of life and the sense of wonder that trees and green spaces instil.

In Oxford we have outstanding forests and woodlands in and around the City such as Brasenose Wood and Shotover. We have stunning iconic tree lined streets such as St. Giles and trees that help to form important wildlife corridors such as the Boundary Brook Wildlife Corridor. We also have valuable tree collections from around the world such as in Headington Hill Park, University Parks and the Botanic Gardens. We also have trees in our neighbourhoods that create a sense of place for our communities.

3.1. Canopy cover data

We know quite a lot about our urban forest and have a range of sources of canopy cover data.

- **Treeconomics i-Tree Canopy Cover Assessment**

In 2015 Oxford City Council commissioned Treeconomics to undertake a canopy cover assessment⁷. This was undertaken using the i-Tree Canopy software tool. This tool uses aerial imagery and

Appendix 1

forward. Although our data is now a little out of date, it still provides us with a very useful baseline.

Oxford's total canopy cover, including trees and shrubs (22.3%), is quite high compared to other cities. Oxford has a similar canopy cover to that of London (21.9%) but has significantly higher canopy cover than cities like Bristol (14%) and Glasgow (15%) but slightly lower than Birmingham (23%) and Exeter (23%).

The i-Tree data shows that we have 74 tree species but the most common are Ash, Willow and Poplar. We also know where our canopy cover is and which areas may need prioritising.

Figure 1 demonstrates what proportion of land has tree cover compared with the other types of land use in each ward. (Note this analysis was conducted against the former ward boundaries.) Areas with a larger proportion of industrial and commercial activities tend to have lower canopy cover. Figures 2 and 3 shows where our canopy cover is in Oxford. The darker an area, the higher the canopy cover. The low canopy cover in Jericho and Osney can be accounted for because Port Meadow, a significant area of open space with few trees, is located in this ward.

96

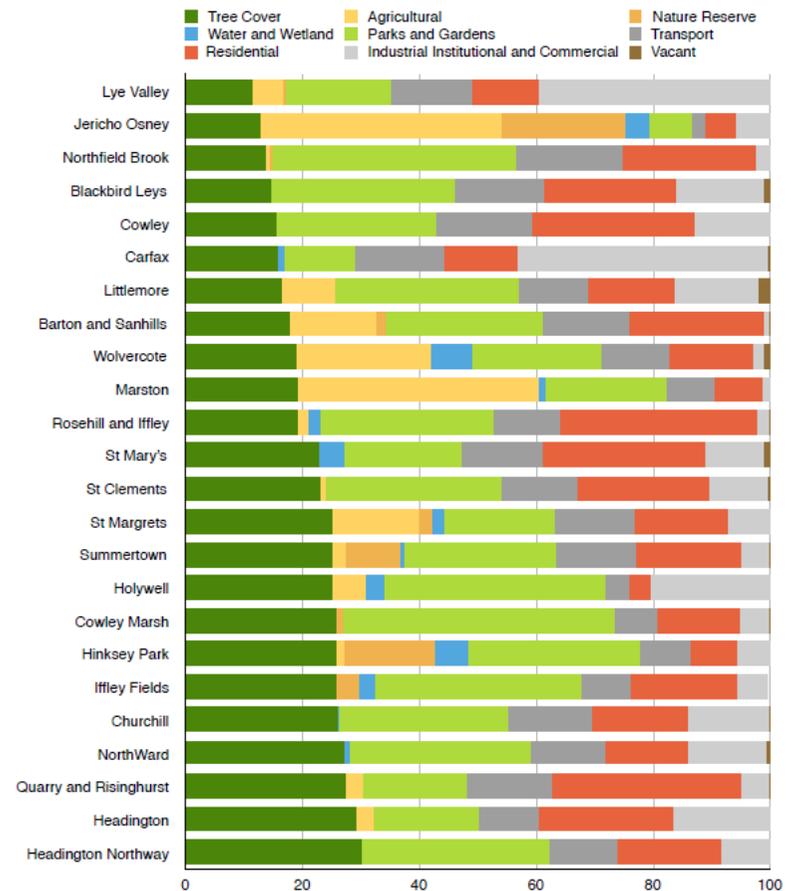
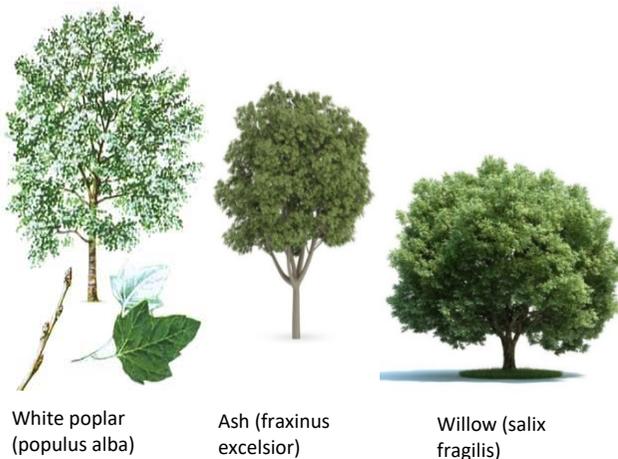


Figure 1 - % Land Use by Ward

Source: Treeconomics iTree Canopy Cover Assessment 2015

Appendix 1

97

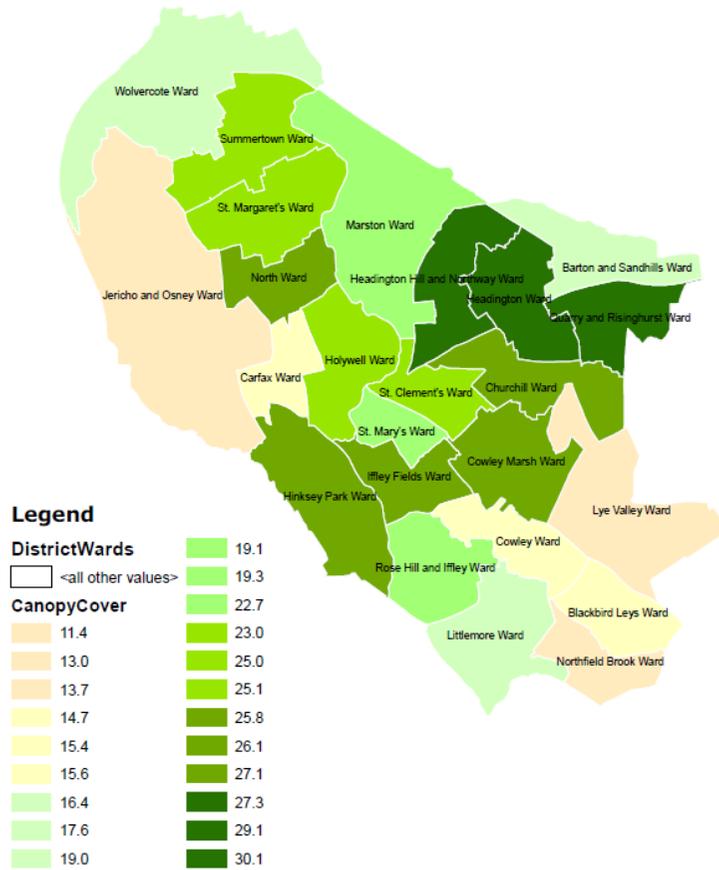


Figure 2 – Canopy Cover Percentages by Ward

Source: Treeconomics iTree Canopy Cover Assessment 2015

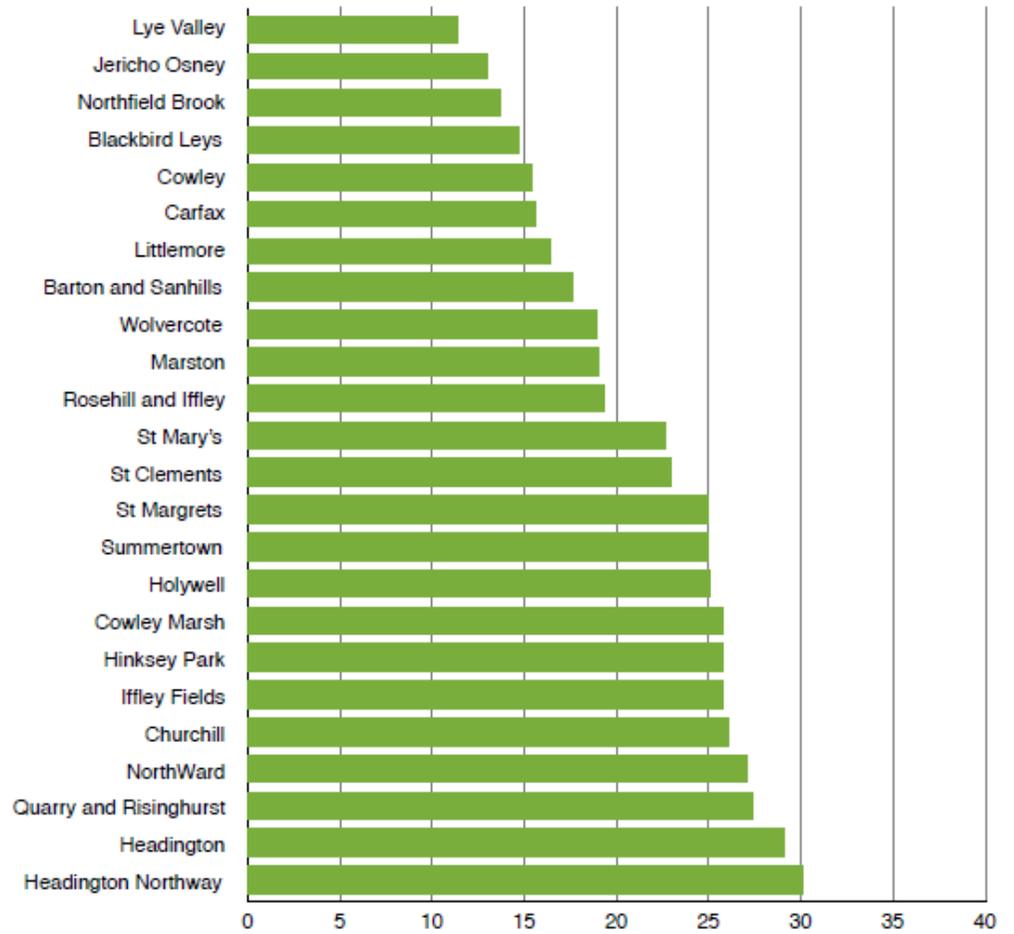


Figure 3 - Canopy Cover by Ward

Source: Treeconomics iTree Canopy Cover Assessment 2015

Appendix 1

3.2. Treescapes

Where is our urban forest? Our Urban forest can be found all over our city from street trees, trees in graveyards, hedgerows, and even in private gardens. It is easy to think of our urban forest as just trees, but it is important to recognise the value of other woody vegetation too, particularly hedgerows. Hedgerows are a hugely undervalued resource that is currently at risk from being lost from our towns and cities. Hedgerows provide many of the same benefits as trees but are particularly important as wildlife corridors because they support a large number species such as pollinating insects and birds.

We have categorised the different areas where we find our urban forest into different “treescapes”. A treescape describes an area of trees or shrubs that forms a function in its environment. These are the main treescapes that are relevant to Oxford:

- Street trees
- Parks, graveyards and open spaces
- Institutional grounds and landscaping (schools, hospitals, universities, business parks etc.)
- Residential gardens
- Allotments and community orchards
- Vegetation along waterways, railway lines and roadside verges
- Woodland and nature reserves
- Farmland/agricultural land
- Hedgerows

Each treescape provides a variety of ecosystems services valuable to Oxford. The types of trees or vegetation required will differ depending on the function and conditions of each treescape.



Headington Hill

Appendix 1

66



Public Parks
and Open
Spaces

Residential
Gardens

Allotments and
Community
Orchards

Linear Routes
(along railways
or waterways)

Woodlands and
Nature Reserves

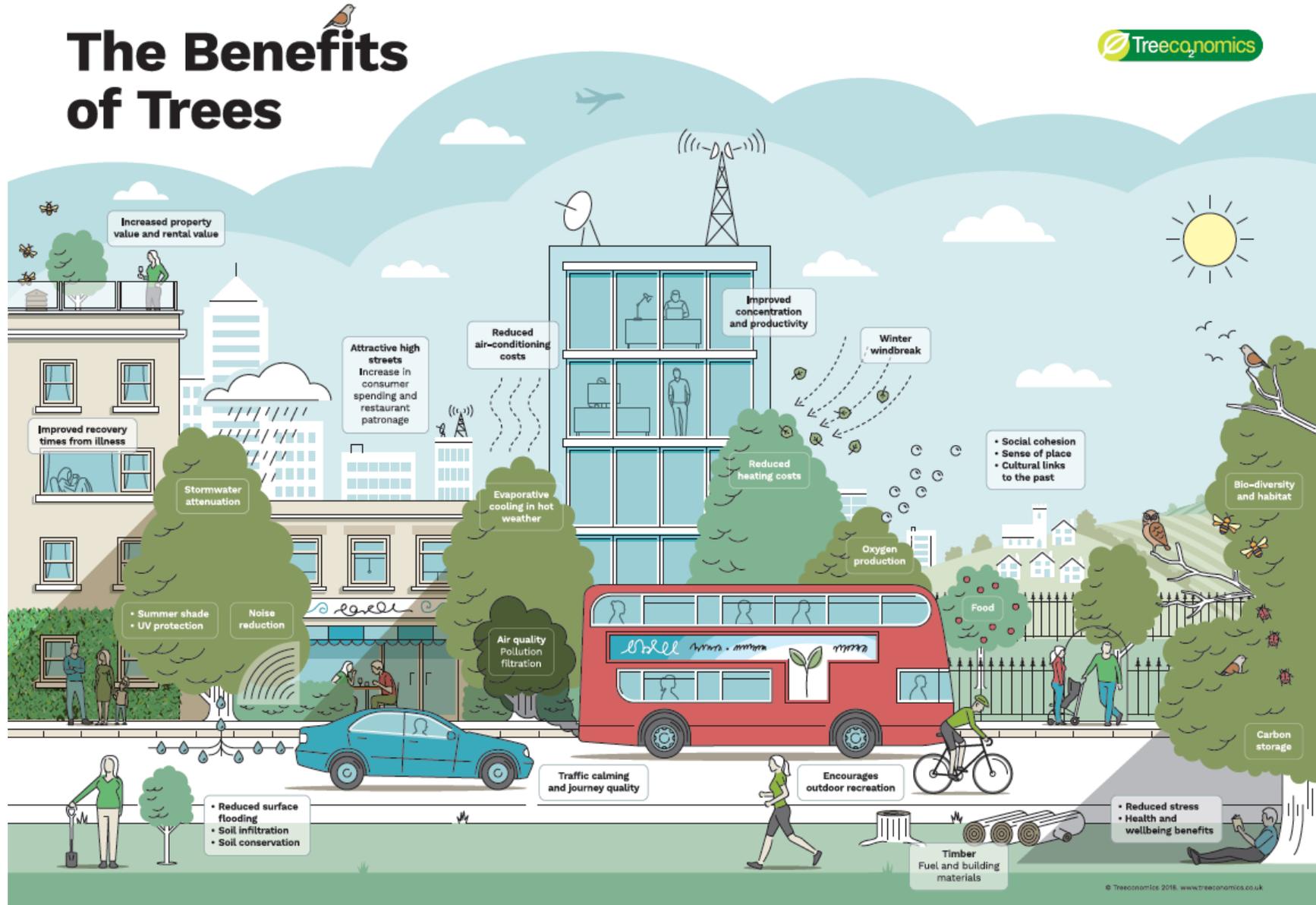
Graveyards

Street
Trees

Institutional
Grounds
(Universities,
schools, hospitals
etc)

Source: Google Maps

The Benefits of Trees



100

Appendix 1

4. Ecosystems Services and the Value of our Urban Forest

There are a huge number of benefits of urban forests and the wildlife within them. We call these ecosystems services. Our urban forest, and the trees, vegetation and wildlife that it is made up of, is beautiful and makes our city a great place to live. The main benefits Oxford's urban forest provides are outlined in this section.

4.1. Physical and mental health and wellbeing

A survey by the Mental Health Foundation in 2018 found that 74% of people have at some point felt stressed to the point of being overwhelmed or unable to cope. Poor environmental conditions such as noise and air pollution can have a detrimental impact on our mental health and can impair our ability to sleep or exercise efficiently. Studies have shown that nature can have significant positive impacts on mental and physical health. National Trust research⁹ shows a return of £200 billion in physical and mental health benefits for £5.5 billion invested in urban green infrastructure. A recent survey by Natural England showed that around 9 in 10 people agreed that natural spaces are good for mental health and wellbeing.

Access to green space and recreation areas often gives us more opportunities for physical activity. Having good physical health often goes hand in hand with having better mental health. We also often use our green spaces for recreation, to socialise, to walk or to play sports. There are also many community groups and volunteer programmes which get people outdoors and managing our wild spaces. The connection to community and sense of achievement are

also good for our mental health. Our urban forest also provides habitat for wildlife, such as birds, bees and butterflies. Studies suggest that simply observing wildlife and animals can have a calming effect. Furthermore, art is often inspired by nature and the act of creating can be relaxing and good for mental wellbeing too. Ensuring that people have access to green spaces and the presence of trees in their communities is vital to our health and wellbeing. The expectation is that expanding our urban forest and enhancing our biodiversity and green spaces will lead to improvements in mental health. This is particularly important among people and communities that are more deprived.

4.2. Urban Heat Island effect

The Urban Heat Island (UHI) effect happens when temperatures in cities and towns are higher (particularly at night) compared to rural areas because of the heat retained by artificial surfaces (such as the tarmac and concrete in roads and buildings). Temperature differences have been measured up to ten degrees higher in UK cities. Why is this a problem? Excessive heat causes excess deaths. Public Health England reports that over the past four years over 3,400 people have died early during periods of extreme heat in England. We know that climate change is likely to result in significantly hotter and drier summers and the effects of this will be particularly felt in urban areas. The UHI effect also causes increased energy costs, greater carbon emissions, increased air pollution and transport network disruptions (road surface melting, rail tracks buckling etc.).

Alongside measures such as reducing energy consumption and increasing the reflective capacity of surfaces in cities, our urban

Appendix 1

forest plays an important role in reducing the UHI. Trees intercept solar heat, absorb carbon dioxide and actively cool the air through transpiration. Trees must have access to sufficient water in order to be healthy and transpire effectively. Combining street trees with sustainable urban drainage systems (SUDS) could be an effective way to achieve multiple benefits.

Understanding the Urban Heat Island effect in Oxford and the role the urban forest can play to reduce its impact is part of the objective that seeks to maximise benefits from our urban forest. Currently, we have no information specific to Oxford on this phenomenon.

4.3. Air quality and emissions

In Oxford, we know that 81% of our carbon emissions come from our buildings and the rest (16%) mainly from on-road transport¹⁰. Our urban forest plays a role in helping to reduce these emissions by directly absorbing carbon dioxide and indirectly by shading surfaces and reducing temperatures. In many institutional buildings and offices, that means a reduced need for air conditioning and the carbon emissions that result from it. Using trees and planting to make attractive walking and cycling routes encourages people to use more sustainable forms of transport as well as directly removing pollutants from the air caused by polluting road vehicles. Oxfordshire County Council's emerging transport strategy might assess such opportunities. This strategy seeks to support and promote such plans, developed in partnership with Oxford City Council, which can help us to achieve these benefits.

Air pollution can cause and exacerbate many health conditions. Exposure to poor air quality has been shown to be directly related to

diseases such as cancer, asthma, stroke, heart disease, obesity and dementia. To tackle this problem the whole of the city of Oxford has been declared an Air Quality Management Area (AQMA).

Oxford City Council has produced an ambitious Air Quality Action Plan¹¹ to significantly reduce emissions in Oxford. Oxford is the first UK local authority to set out a city-wide air pollution reduction target that goes beyond the legal targets set out by the UK Government.

Trees and vegetation, when correctly sited, can help reduce the impacts of certain types of pollution through dispersion and deposition. Defra acknowledges that vegetation can help to reduce air pollution in cities. However, they state this is primarily by affecting how these pollutants are dispersed and not by the removal of pollutants¹². Defra's Air Quality Action Group (AQEG)¹³ makes clear that trees can have air quality benefits but on their own they are not a solution to the air quality problems at a city scale.

In Oxford our urban forest is estimated to filter 65 tonnes of airborne pollutants each year. This can be calculated as a saving of over £1.12 million in social damage costs.

The urban forest can help with other forms of pollution too, such as noise pollution. Noise pollution can cause stress and mental health problems. It not only affects our behaviour but that of our wildlife too. Forest Research says that planting "noise buffers" can reduce noise by up to 50% if done correctly. Guidance on how to maximise using trees and vegetation as noise buffers will be promoted through this strategy.

Appendix 1

4.4. Community cohesion and engagement

Our green spaces provide a space for communities to socialise and to relax. However, our urban forest plays a role beyond simply providing a space to be, many people are actively involved in managing it too. Forest schools, volunteer conservation groups, community tree planting projects and citizen science projects are all examples of how communities can engage with our urban forest. Community orchards and the planting of fruit trees in public spaces also brings communities together for harvesting. Often the most successful engagement comes from communities having a sense of ownership of their environment. This strategy seeks to involve more people in such projects from all parts of the city.

4.5. Biodiversity

Biodiversity includes all living things, including all plants and animals and the complex ecosystems which they are part of. It is being recognised all over the globe that biodiversity loss as well as climate change pose a real and significant planetary emergency. The National Biodiversity Network State of Nature report 2019 reported that biodiversity in the UK had fallen by 60% since 1970. In 2010, the Lawton Report advocated for biodiversity efforts to focus on the principle of “more, bigger, better, joined”. The practical application of this principle is relevant now more than ever, and the development of Nature Recovery Networks and improving the management of existing wildlife habitats is underway locally and nationally.

Oxfordshire is currently developing one of these Nature Recovery Networks. The network identifies areas where conservation efforts

will have the most benefits for wildlife and also the ecosystem services that they provide. A network map is in development led by a partnership of local nature conservation organisations and local authorities.¹⁴

The Oxfordshire Treescape Opportunity Mapping Project mapping demonstrates that there are opportunities in Oxford for the planting of trees and hedgerows that could significantly benefit the Nature Recovery Network by linking habitats.

Oxford is home to a number of legally protected habitats and species many of which make up our urban forest including: traditional orchards, hedgerows, wet woodland, hedgehogs, water voles and swifts. This strategy will help to direct actions that contribute to the protection of these important habitats and species.

Native vs non-native

Species that are considered native are species that became established in the UK after the last ice age over 10,000 years ago. Native trees and other vegetation are important because the other plants and animals that colonised over that same time developed alongside them using them for their food and habitat. Non-native species refer to species that have been brought to the UK by people. Non-native species do not share the same long relationship with these other plant and animal species and do not support them so well. Native tree and plant species have a much higher biodiversity value than non-native ones because they support the life cycle stages of thousands of native invertebrates, bats and birds. This strategy promotes the use of native species wherever possible. Where non-native species are planted, they should be climate appropriate and their biodiversity value can be enhanced by

selecting near-native varieties or those with edible fruits, seeds or nectar.

Native species have a much higher biodiversity value than non-native species. Native species should be prioritised over non-natives wherever possible.

4.6. Flood control and water quality

For many parts of Oxford flooding is a significant issue and with wetter winters predicted in the future, it is set to continue. Significant areas of Oxford including South and West Oxford, Port Meadow, and Lower Wolvercote are located within the floodplain of the River Thames and its tributaries. North eastern areas, towards Marston, are located in the Cherwell floodplain, Florence Park areas and parts of Cowley are at risk of flooding from the Boundary Brook, and other areas are at risk of flooding from smaller watercourses, such as the Littlemore Brook or Northmoor Brook. Most of Oxford's flooding is caused by river flooding, where the rivers burst their banks after periods of heavy rainfall. However, this can be compounded by surface water flooding, this occurs where hard surfaces cannot absorb heavy rainfall.

Oxford's urban forest can help with both flooding from rivers and surface water flooding. Canopy cover intercepts the rain and slows it down before it hits the ground. This allows the rain to reach, and infiltrate into the ground more slowly and also allowing some of the water to evaporate back into the atmosphere without it ever even reaching the ground.

Appendix 1

In Oxford, our urban forest intercepts around 80 thousand cubic metres of rain each year, which is approximately £120,000 saved in stormwater treatment costs.

By reducing the volume of run-off entering the sewer system, the volume eventually reaching watercourses is also reduced, which can also help reduce flood risk from rivers and reduce raw sewage spillover. Designing urban trees so that they allow more water into the soil (such as removing the asphalt around tree pits) can also help reduce surface run-off.

For river flooding, trees can slow the flow of run-off from farmland into water courses and they provide structure to the soil. However, the benefits of tree planting to significantly reduce river flooding would need to be in the form of flood management upstream to help reduce run-off from farmland. An example is Wild Oxfordshire's Evenlode Catchment Project¹⁵ where a natural flood management demonstration project is being undertaken, and the Environment Agency is looking into more projects of this nature in the Thames Valley.

In Oxford we encourage sustainable drainage systems (or SuDS) in our new developments. There is the potential to incorporate our urban forest into SuDS designs such as in rain gardens (spaces that allow water to infiltrate into the ground naturally) but also through more engineered solutions, such as incorporating SuDS into tree pit design. Not only is this a good use of space but the trees are more likely to reach their full potential.

Appendix 1

The Oxfordshire TreescapE Opportunity Mapping Project is mapping the potential for planting in our riparian¹⁶ zones that could contribute to reducing soil erosion in flood events. A recent study by the Environment Agency¹⁷ showed that wooded buffers scored highly for controlling diffuse pollution, carbon retention and flood management. The study highlighted that trees can reduce airborne spray drift of chemicals used in agriculture as well as tree roots helping to stabilise banks and filtering and trapping pollutants. Trees along rivers also increase shading which cools water temperature and contributes to reducing stress on aquatic life. Some of Oxford's riparian buffer zones overlap with the Nature Recovery Areas and scope for maximising benefits should be assessed.

4.7. Carbon storage

Trees absorb carbon dioxide from the atmosphere and store it as timber. Some of this carbon dioxide is rereleased from wood in the natural processes of decay by bacteria and fungi or by combustion for example, if used as a source of fuel. Putting timber into long-term uses such as construction or furniture keeps the carbon stored for longer. Studies are showing that older, larger trees store significantly more carbon compared to smaller trees. We need to ensure that our largest and oldest trees are healthy so that we maximise their benefits and that we replace with large tree species where appropriate.

In Oxford our urban forest is estimated to remove approximately 2,500 tonnes of carbon from the atmosphere each year. This service has an estimated

value of £619,000. Our urban forest stores over 76,000 tonnes of carbon worth over £18 million.

Objectives in this strategy seek to ensure that our mature trees that are storing more carbon are properly taken care of. New planting will also seek to include species that we know store the most carbon.

4.8. Landscape character, heritage and culture

Oxford's landscape and its relationship to the built environment is iconic. Potential land-use changes, including tree planting, should consider impacts and seek opportunities to enhance Oxford's distinctive character. In 2002 the Countryside Agency in partnership with Oxford City Council undertook a comprehensive Landscape Character Assessment. Although this study is now quite old, it is still relevant. This study outlines the role trees play in the landscapes and identifies some opportunities for enhancement through planting and management. Landscape Character Assessment specifically identifies where new tree planting should be focused to maintain or enhance the character. E.g. Church Cowley Core "...encouraging the planting of new large trees to ensure the long-term survival of the leafy character of this area." The principles for how to ensure that landscape character is conserved and enhanced through this urban forest strategy will be guided by this document.

In 2015 Oxford City Council, in partnership with Oxford Preservation Trust and Historic England undertook an Assessment of the Oxford View Cones¹⁸. Oxford is famous for its skyline and being able to walk in the surrounding countryside and look back at the city's "dreaming spires" is acknowledged to have significant inheritance value and should be managed for future generations. Within the assessments

Appendix 1

of each view cone are details on where tree planting can be used to enhance the quality of views and also where tree management is recommended to re-establish views. Trees play an important role in adding to the quality of views by providing an aesthetic green setting. E.g. the trees in North Hinksey and the valley beyond help to screen some of the 20th century industrial buildings such as Osney Mead and Oxpens. This strategy seeks to ensure that consideration is given to views as important heritage assets where new planting schemes are concerned.

Notable trees

There are so many trees or groups of trees in Oxford that have stories that surround them. Many of them feature in literature from Tolkien to Pullman and Matthew Arnold. There was an outpouring of emotion for the pink blossomed Almond tree outside the University Church of St Mary the Virgin on the High Street when it was felled in 2019 due to safety reasons. Evidence suggests that the tree suffered in the heatwave of summer 2018 and was adversely impacted by the heavy traffic flows of large vehicles passing in close proximity. Replacement trees have since been planted.

The great Yew Tree in Iffley Churchyard is thought to be one of the oldest trees in Oxfordshire. It is at least as old as the church, built in 1160, but is likely to be older and evidence that it may have been a pre-Christian site of worship. The tree may also have been the inspiration for Lewis Carroll's *Alice in Wonderland*.

Oxford has a wealth of notable trees. Many of these trees may not be notable in the technical sense but are notable to the people who live by them and look out at them every day.

This strategy gives us an opportunity to celebrate these trees and to identify actions that will help us to plan for their replacement. Tree Protection Orders only require replacement trees to be planted after the loss of the original tree. If we wait for trees to die before we replace them, then we will have a significant hole where the tree once stood. However, if we plan ahead, we can plant “understudy” trees otherwise known as “succession” tree planting. These trees will be growing and preparing to replace the original tree when it dies. Oxford City Council looks to secure succession tree planting when approving landscape plans that are required by planning conditions. However, it is important to bear in mind that some trees occupy the perfect location and their loss can only be mitigated by planting in



Almond Tree on the High Street Credit: Tejvan Pettinger

Appendix 1

exactly the same place. The City Council's planning conditions will only cover a small portion of such trees. This strategy seeks to encourage landowners and managers and communities to identify trees that are important to them and to assess opportunities for planting understory trees where appropriate.

There are many other ways we can celebrate and raise awareness of our notable trees such as "Green Plaque" schemes, like the blue plaque scheme but for trees, tree walking trails or tree story competitions.

4.9. Economic benefits and tourism

Economic benefits of urban forest include: the production of by-products (such as timber, mulch and fruit), tourism, increased property values, increased inward investment (high quality landscaping attracts business) and trees can be valued as assets, giving them a financial worth. Our urban forest is also important for our pollinators that are essential to our agriculture, allotments and city farms¹⁹. Oxford is regarded as the tourism gateway to the rest of Oxfordshire. Approximately 7 million people visit each year and they contribute over £750 million worth of income for Oxford's local businesses. The setting of the city and the university with its parks and grounds and its setting within the landscape feature heavily on making it a special place to visit.

The economic benefits from wood by-products are less significant in an urban forest like Oxford due to the lack of space for any sizeable production. Furthermore, orchards are unlikely to be large enough to justify the equipment costs for a commercial operation. There is potential for community orchards and opportunities to develop these should be encouraged. Our urban forest also directly provides

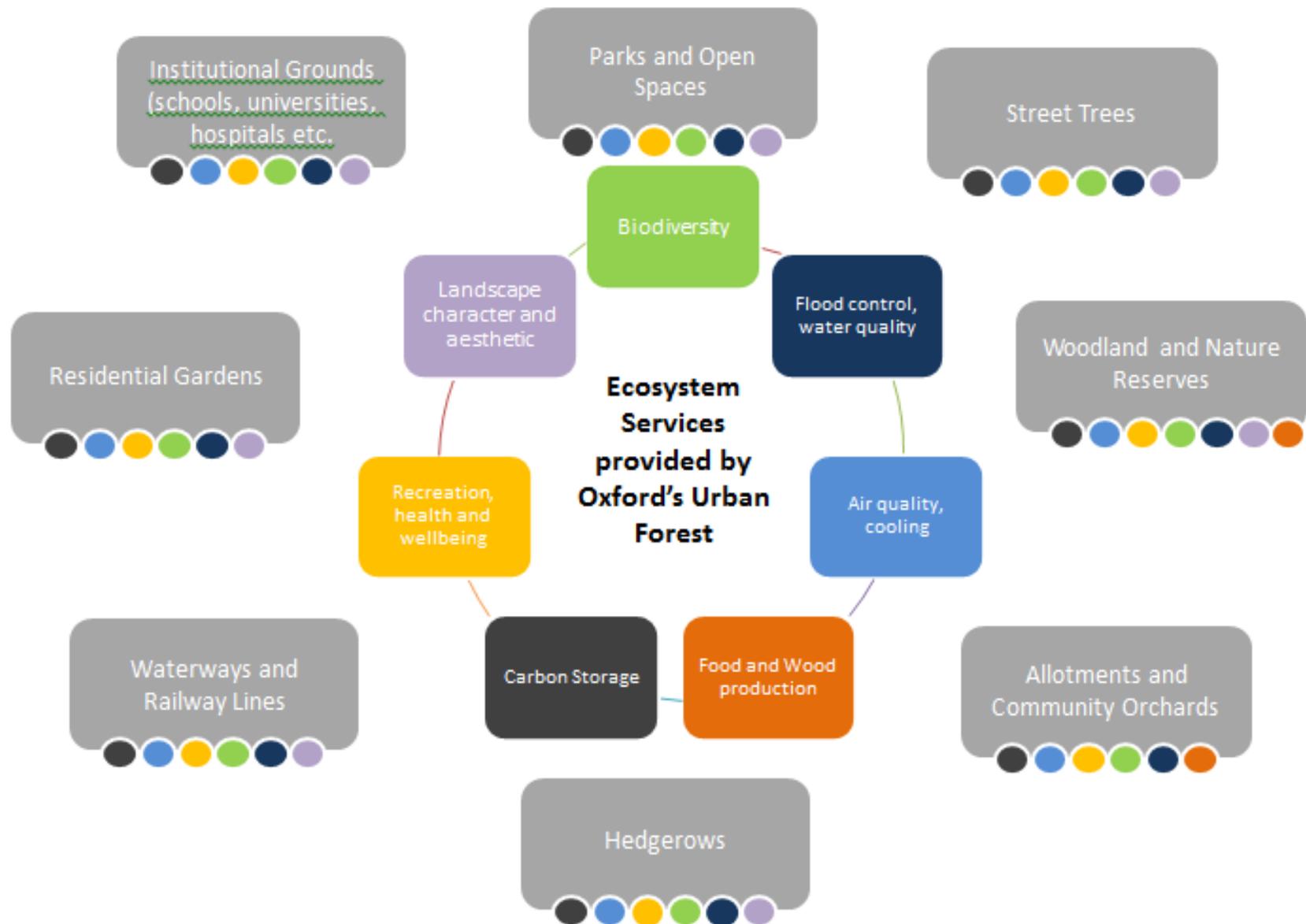
employment such as through tree surgeons and grounds maintenance companies. Research by the Woodland Trust has shown that woodland management can be significantly cheaper to maintain than some types of grassland²⁰. Landowners and managers could benefit economically from shifting their land-use to woodland.

Other economic benefits of the urban forest relate to reduced building energy costs from tree shading and the contribution that trees make to raising property values and investment potential. Studies have shown that people actually spend more if they are shopping in areas with more trees²¹. The importance of good quality place making and design for our economy as well as quality of life is demonstrated. Developers, decision makers and other key stakeholders are encouraged to think about how they can generate the most value from our urban forest.

There are so many benefits of our urban forest but it is also important to acknowledge that trees don't always come without their problems. Some evidence shows that street trees can trap pollutants in certain circumstances and many people suffer health issues from pollen. Such negative impacts give more weight to the need for using the right tree, right place principle where negative impacts can be minimised.

Whilst it is useful to be able to quantify the benefits that we derive from our urban forest we must recognise that trees and the wildlife they support have an intrinsic value irrespective of their benefits to people.

Appendix 1



Appendix 1

5. What can we learn from our data?

The Oxfordshire Treescape Opportunity Mapping Project uses an ecosystems services approach to determining which trees are suitable for specific locations and has identified:

- A clear correlation between low canopy cover in the southern part of the city and areas of deprivation.
- Scope for prioritising the Nature Recovery Network (NRN) in expanding our urban forest.

Figure 4 shows our canopy cover in Oxford. Figure 5 shows the land use by habitat most relevant to trees and where there may be opportunities for more trees. The highest percentage land use is buildings. 19% of land area is gardens (private residential gardens), which presents an interesting opportunity for new trees. There may be other opportunities in farmed land (13%), roadsides and verges (13%), and amenity grassland (13%).

5.1. Deprivation

Oxford has high levels of inequality. According to the 2019 Index of Multiple Deprivation²², 9 of Oxford's 83 neighbourhood areas were among the 20% most deprived areas in England. These areas are located in The Leys, Rose Hill, Littlemore, Carfax and Barton. These areas experience higher levels of low skilled workers, households on low incomes and crime rates. There are also areas where deprivation for children is in the 10% most deprived nationally. These figures also show that 12 neighbourhood areas in North Oxford, Marston,

Headington, Quarry and Risinghurst and Jericho and Wolvercote are among the top 10% least deprived in the country. We know that poverty increases the risk of poor mental health²³. Figures 6, 7 and 8 demonstrate that there is a general trend for lower canopy cover in more deprived areas of the city.

The Oxfordshire Treescape Opportunity Mapping Project has identified that within the areas of deprivation there is potential to increase:

- trees in private and communal gardens
- street trees
- trees in public parks and open spaces

The expectation is that increasing canopy cover will contribute to improving environmental quality, community cohesion and physical and mental health of residents in these areas that in turn can contribute to reducing deprivation.

Areas of deprivation in Oxford have been identified using the Indices of Multiple Deprivation (IMD). IMDs create a measure to show the relative deprivation between areas²⁴. Multiple components are weighted to combine into a single score of deprivation. The components used are: income, employment, education, health, crime, barriers to housing and services and living environment.

Appendix 1

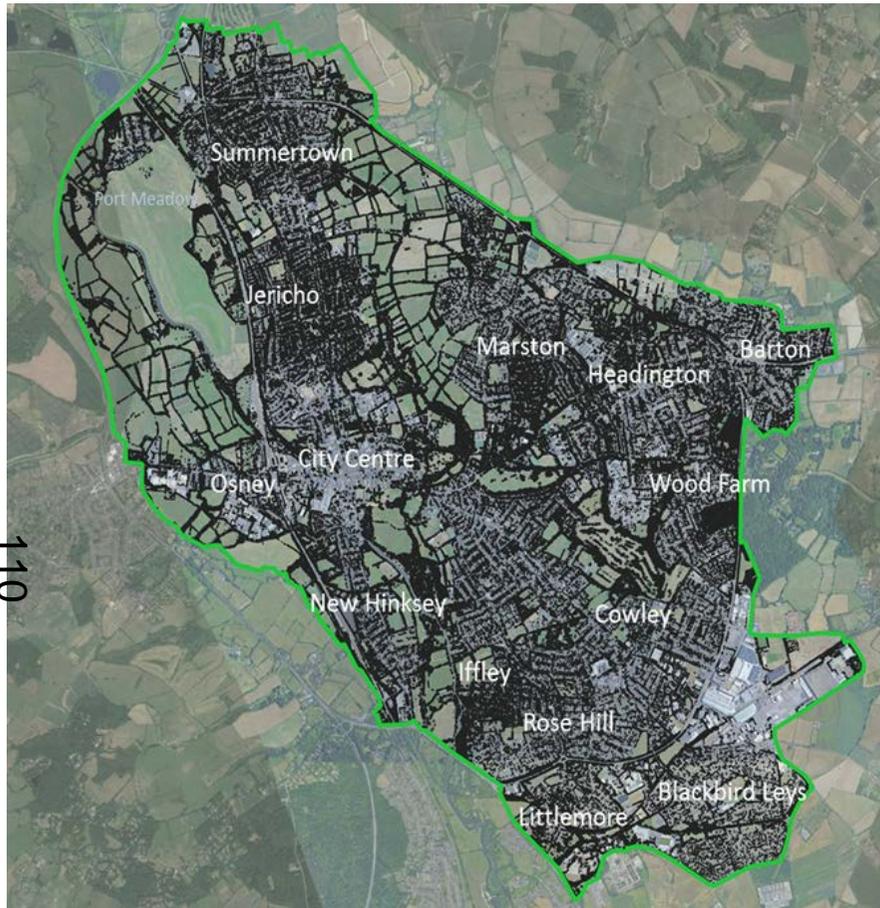


Figure 4 Canopy Cover in Oxford

Source: Oxfordshire Treescape Opportunity Mapping Project (BlueSky data)

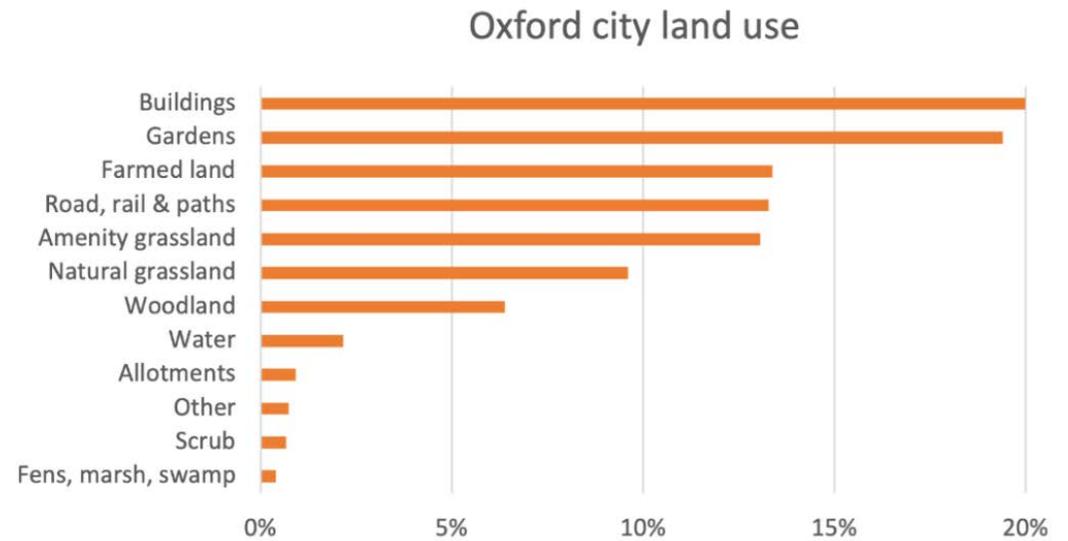


Figure 5 % Land Use in Oxford

Source: Oxfordshire Treescape Opportunity Mapping Project (BlueSky data)

Correlation between Low Canopy Cover and Index of Multiple Deprivation

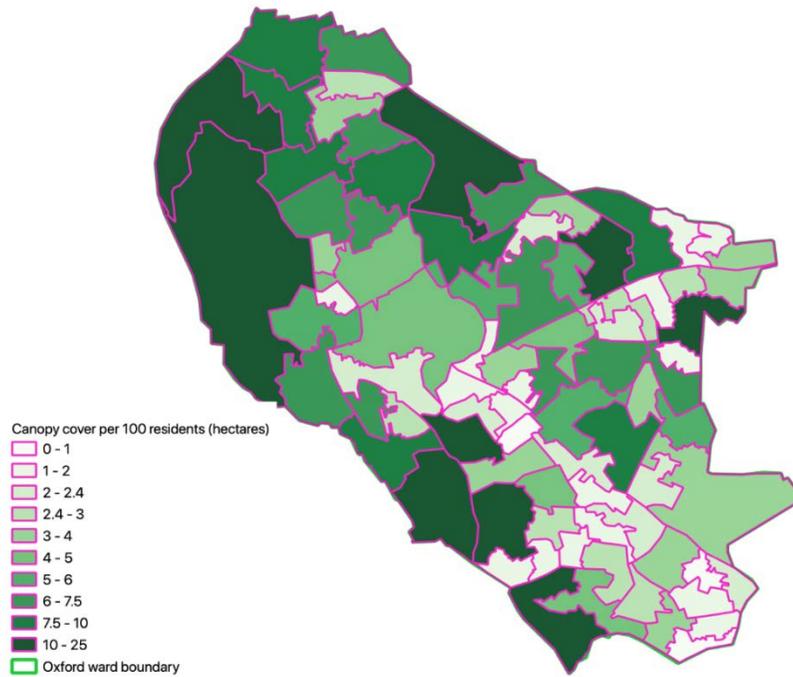


Figure 6 Canopy Cover per 100 Residents (ha)

Source: Oxfordshire Treescape Opportunity Mapping Project (BlueSky data)

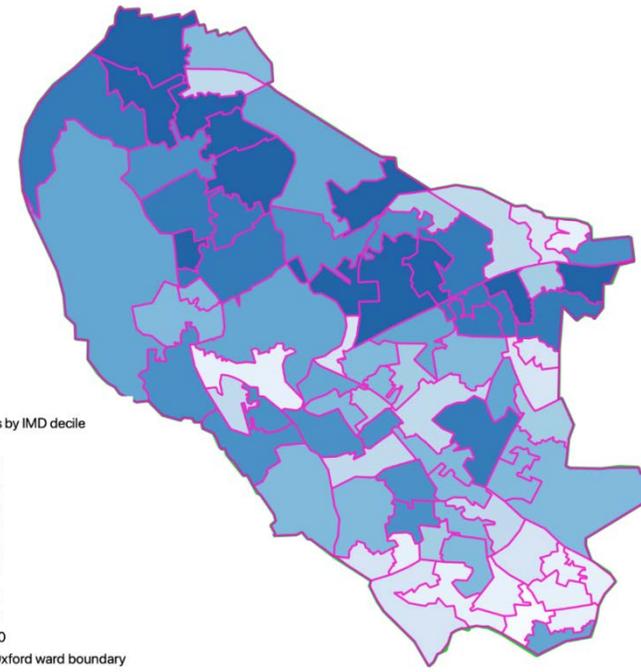


Figure 7 - Index of Multiple Deprivation by LSOA* (deciles - 1 most deprived to 10 least deprived)

Source: Oxfordshire Treescape Opportunity Mapping Project (BlueSky data)

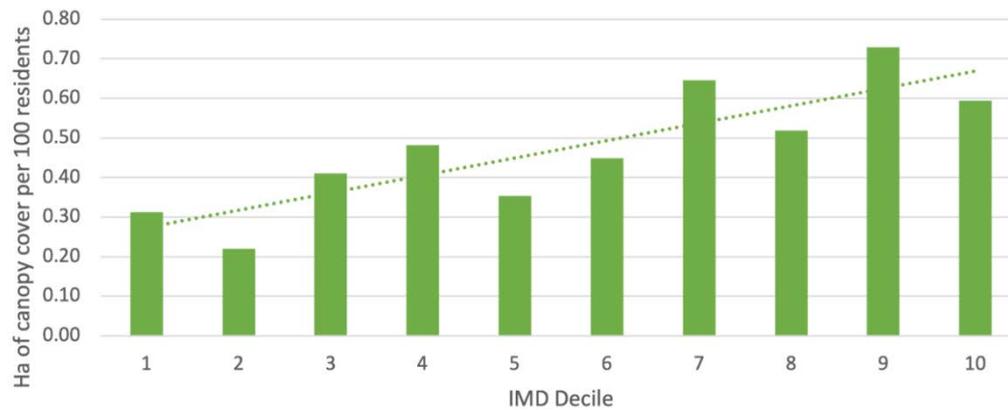


Figure 8 - Canopy Cover (ha) per 100 residents by Index of Multiple Deprivation decile (with trend line)

Source: Oxfordshire Treescape Opportunity Mapping Project (BlueSky data)

*Lower Layer Super Output Areas (LSOA) are a geographic hierarchy designed to improve the reporting of small area statistics in England and Wales.

Appendix 1

5.2. Nature Recovery Network (NRN)

The Oxfordshire Nature Recovery Network (NRN) identifies areas where conservation efforts will have the most benefits for wildlife and the ecosystem services that they provide.

Oxford has an important role in the Nature Recovery Network and linking to the wider county as it lies at the confluence of the Thames and Cherwell (see figure 10).

There are opportunities to increase canopy cover in areas such as Jericho and Osney, Wolvercote and Marston where canopy cover is lower and also corresponds to the Nature Recovery Network. However, it is important to note that the low canopy cover in Jericho and Osney Ward is significantly affected by the presence of Port Meadow. Port Meadow is one of the largest open spaces in the north of the city. The River Thames flows through it and the flood plains provide important habitat for many species of flora and fauna some of which are rare. Port Meadow and Wolvercote Common are a Site of Special Scientific Interest (SSSI) for this reason. Tree planting is unlikely to be appropriate in much of this area.

A principle objective of this strategy is to strengthen the Nature Recovery Network. The Oxfordshire Treescape Opportunity Mapping Project data shows us that the Nature Recovery Network covers 37% of Oxford's area.

Figure 9 shows the land uses within the Nature Recovery Network and identifies that farmed land presents a potential opportunity for increasing our canopy cover. There is not a great deal of overlap

between our Nature Recovery Network and the areas of deprivation (as shown below Fig 11). 91% of the Nature Recovery network falls within the least deprived parts of the city. A focus on the NRN is unlikely to address deprivation significantly and so these two areas of priority will need to be developed independently of each other. However, where there are overlaps, then these areas should be prioritised.

Within the Nature Recovery Network the focus should be on identifying opportunities for:

- new woodland
- hedgerows
- joining up habitats

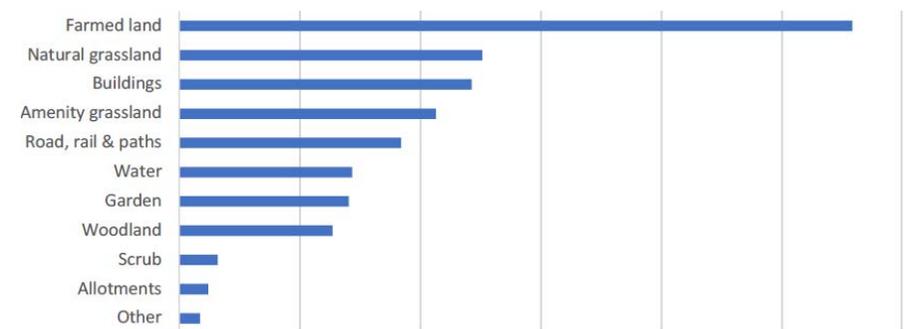


Figure 9 - Land Use within the Nature Recovery Network (ha)

Source: Oxfordshire Treescape Opportunity Mapping Project (BlueSky data)

Appendix 1

113

Nature Recovery Network
 NRN_CoreZone (Oxon)
 NRN recovery zone (Oxon)

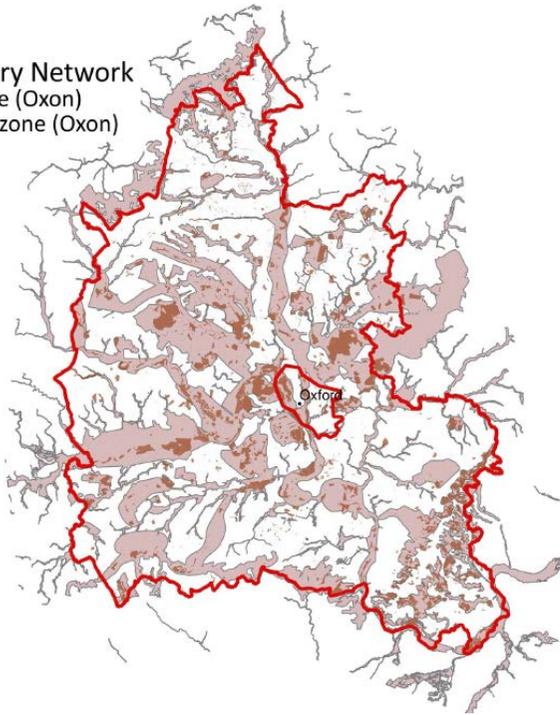


Figure 10 - Nature Recovery Network in Oxfordshire and Oxford

Source: Oxfordshire Treescape Opportunity Mapping Project

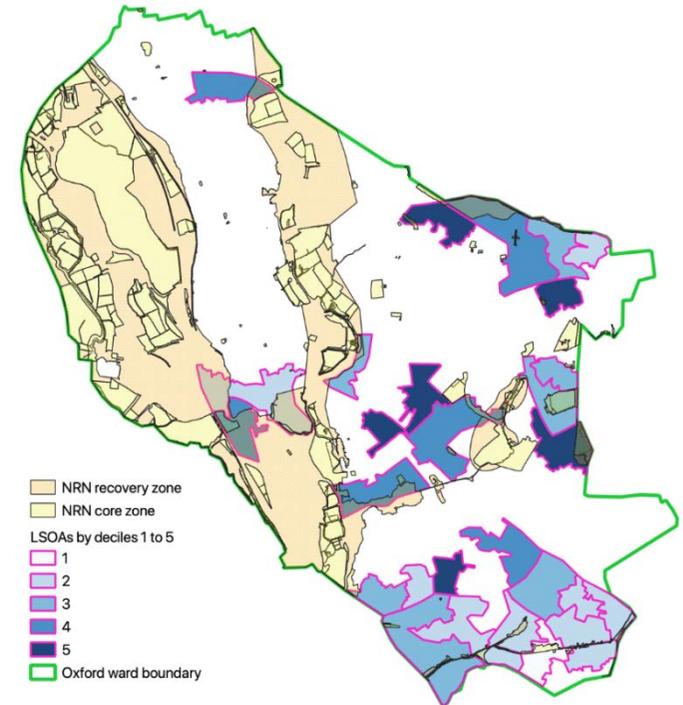
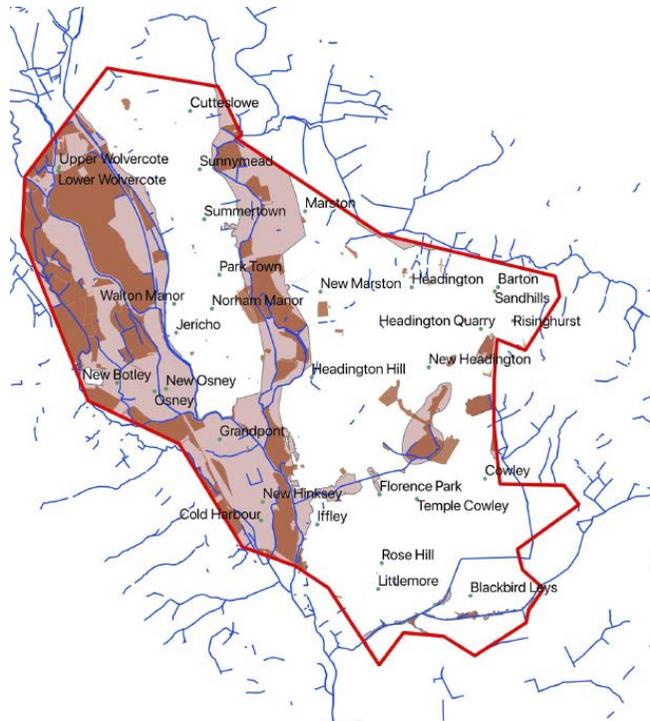


Figure 11 - Nature Recovery Network and Index of Multiple Deprivation (most deprived deciles 1 to 5)

Source: Oxfordshire Treescape Opportunity Mapping Project (BlueSky data)

Appendix 1

6. Threats to Oxford's Urban Forest

6.1. Climate change

Climate change is projected to bring us hotter drier summers, and very wet winters. We are likely to experience extreme weather events, such as heatwaves and flooding. The environmental conditions that our urban forest depends on will change and could make it more susceptible to decline. New pests and diseases are likely to emerge and some tree species may not adapt as well to new environmental conditions.

6.2. Lack of diversity and biosecurity

A lack of diversity in the urban forest can make it vulnerable to disease or the impacts of climate change. A healthy ecosystem will have a good range of age, species and spatial diversity. The iTree Eco Report recorded 74 different tree species in Oxford. This represents reasonable species diversity. However, the largest percentage is Ash at 11%. Ash is particularly vulnerable to disease. The loss of 11% of our tree stock would be significant. Fragmentation of habitats can weaken diversity. Maintaining and developing networks of green spaces is crucial to healthy populations and healthy trees are more resilient to pests and disease.

Biosecurity is important for preventing pests and diseases from establishing and spreading. Biosecurity refers to a set of precautions that prevent the introduction and spread of diseases and pests such as insects, bacteria or fungi. Our industry professionals, land managers and land owners all play an important role in helping to maintain our biosecurity.

Ash Dieback

The Woodland Trust warns that ash dieback will kill over 80% of ash trees across the UK. It is caused by a fungus which penetrates the tree, blocks its water transport systems which eventually leads to death. The impact of such a huge loss of trees will have a significant impact on biodiversity and our landscapes. The practical costs of managing the disease and of losing the ecosystems services they provide will be huge. Some ash trees may be tolerant to ash dieback so some population recovery may be possible over a long period of time.

6.3. Ageing or declining tree population

Trees can decline for a number of reasons such as age, unfavourable growing conditions, pest or disease problems or environmental stresses. Stressed trees are more vulnerable to pests and disease and the ecosystems service benefits they provide will not be being realised to their full potential.

6.4. Increase in urban development or inappropriate development

Addressing the need for housing is a key priority for Oxford City Council. The Local Plan includes policies on protecting and enhancing Green Infrastructure and how to compensate and mitigate for loss of trees through new development. Inappropriate tree-planting, lack of space for nature and lack of appropriate maintenance are also significant threats to our urban forest.

Appendix 1

Tree Felling and Replacement

The felling of trees is a concern to many people. Oxford City Council has a Tree Management Policy that sets out that a tree will only be felled if it is identified as dead, dying, diseased, dangerous (and is posing an unacceptable risk to public safety) or damaging property (e.g. subsidence when confirmed by technical evidence). This policy also specifies that any felled tree will be replaced, although it is not always possible or prudent to replace in exactly the same location. Other landowners and managers in Oxford will be encouraged to adopt Tree Management Policies to protect trees from unnecessary felling and to always replace them.

7. Right Tree, Right Place

Deciding where and how to develop our urban forest – right tree, right place

Our urban forest is not just about our trees. Our urban forest includes our trees but also our wild places, cultural landscapes and providing ecosystem services such as carbon storage. Tree planting may not always be the most appropriate solution. This section shows us where planting trees is and isn't appropriate in Oxford.

Creating the conditions for natural regeneration is a great low carbon way of helping new woodlands establish. So consider this as an option first, before deciding to plant trees.

Is the site suitable for natural regeneration?

Sites suitable for natural regeneration will be protected from deer and rabbits, have limited ground or soil disturbance, be close to a seed source and have a history of woodland or tree/scrub cover.



Check out Flora Locale's technical advisory note: "Creating Woodlands Naturally" www.floralocale.org



Tree planting may be the preferred option if the setting is parkland, a cultural landscape or being used as a community or partner engagement tool.

What type of site is it?

The following page shows different habitat types and geographical features in Oxford. If tree or vegetation planting is the preferred option then it is important to understand if the proposed site is appropriate for tree planting. Particular habitats such as wetlands and limestone grassland are not suitable for tree planting. It's a good idea to always seek advice before planting anywhere to make sure you get the most out of it.

GENERAL ADVICE

Reduced pesticide, sympathetic management and structural complexity will all benefit a whole range of wildlife, from plants to invertebrates, pollinators, mammals and bats and birds. Always try to plant native tree species (except in orchards) and try to see what is growing naturally in hedges, field corners and unmanaged places for the most suitable, locally adapted species.

Species

Native species have a much higher biodiversity value than non-native species. Native species should be prioritised over non-natives wherever possible.

Native species suitable for Oxford include: field maple, oak, blackthorn, small leaved lime, hornbeam, birch, hazel, holly, hawthorn, wild cherry, crab apple, various willows, black poplar.

Appendix 1

Residential Gardens

Residential gardens make up a significant part of green infrastructure in urban areas. They can provide important habitats and corridors for wildlife, can reduce surface water runoff and reduce the energy demand of buildings. However, domestic gardens can also introduce problems, such as the introduction of invasive or non-native plant species or the misuse of fertilizers or pesticides. Choose correct size and species such as flowering and fruiting species. Apples, pears, cherries, hawthorn, blackthorn and bramble are all good for encouraging wildlife into the garden and tend to be small. Please also consider neighbours..

Right Tree, Right Place

Institutional Grounds and Landscaping (schools, hospitals, business parks etc)

There are potentially lots of opportunities for greening up sites. Check to see what habitat types you have on your grounds before planting. Choose appropriate species, whilst native species are normally preferable, there may be instances where exotics are appropriate for example if there is a story, history or to continue a designed planting scheme.

Always ensure you have the landowners permission

Don't Plant
Seek Advice
Go Ahead but Follow Guidance

Agricultural Land

Agricultural land is often suitable for tree planting due to the limited wildlife interest/value. It is important to be considerate of hedges and in-field trees though. Permanent pasture is better but a mix of grass, scrub and trees will likely be best for nature. Find out if the site has a tree-past, such as orchards. Re-planting with appropriate fruit trees could be a good decision.

Street Trees
Street trees make our streets beautiful and characterful. They make our neighbourhoods more desirable places to live, not just for people but for wildlife too! They provide significant environmental and cultural benefits to our streetscapes. However, streets are an unnatural environment for trees and therefore need specific protection and management. We need to make sure we all see them as a public asset and value them accordingly. Street trees should follow TDAG Trees in hard landscapes guide and tree pits that also contribute to Sustainable Urban Drainage Systems should be considered.

Allotments and Orchards

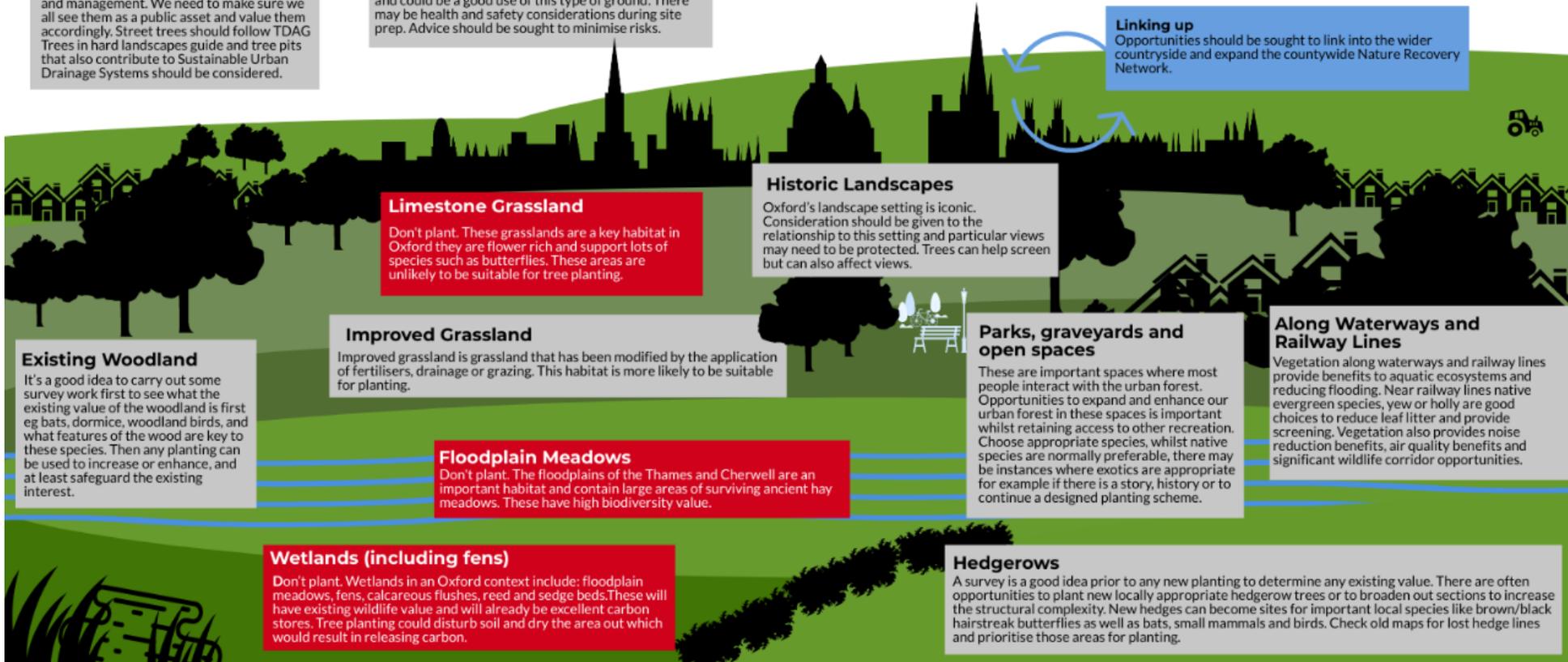
Orchards are recognised as a priority habitat. Encourages healthy eating, reducing food miles, recreation, health and wellbeing. Potential for small fruit trees on allotments but shade issues need to be considered.

Former Landfill
There are a number of former landfill sites in Oxford. Some of these sites may be suitable for tree planting and could be a good use of this type of ground. There may be health and safety considerations during site prep. Advice should be sought to minimise risks.

Nature Reserves
Most legally protected nature reserves/ local wildlife sites/Sites of Special Scientific Interest (SSSIs) will have a management plan or strategy guiding their progress, so tree planting may or not be compatible, check with the site manager/owner

Linking up
Opportunities should be sought to link into the wider countryside and expand the countywide Nature Recovery Network.

117



Limestone Grassland
Don't plant. These grasslands are a key habitat in Oxford they are flower rich and support lots of species such as butterflies. These areas are unlikely to be suitable for tree planting.

Historic Landscapes
Oxford's landscape setting is iconic. Consideration should be given to the relationship to this setting and particular views may need to be protected. Trees can help screen but can also affect views.

Improved Grassland
Improved grassland is grassland that has been modified by the application of fertilisers, drainage or grazing. This habitat is more likely to be suitable for planting.

Parks, graveyards and open spaces
These are important spaces where most people interact with the urban forest. Opportunities to expand and enhance our urban forest in these spaces is important whilst retaining access to other recreation. Choose appropriate species, whilst native species are normally preferable, there may be instances where exotics are appropriate for example if there is a story, history or to continue a designed planting scheme.

Along Waterways and Railway Lines
Vegetation along waterways and railway lines provide benefits to aquatic ecosystems and reducing flooding. Near railway lines native evergreen species, yew or holly are good choices to reduce leaf litter and provide screening. Vegetation also provides noise reduction benefits, air quality benefits and significant wildlife corridor opportunities.

Existing Woodland
It's a good idea to carry out some survey work first to see what the existing value of the woodland is first eg bats, dormice, woodland birds, and what features of the wood are key to these species. Then any planting can be used to increase or enhance, and at least safeguard the existing interest.

Floodplain Meadows
Don't plant. The floodplains of the Thames and Cherwell are an important habitat and contain large areas of surviving ancient hay meadows. These have high biodiversity value.

Wetlands (including fens)
Don't plant. Wetlands in an Oxford context include: floodplain meadows, fens, calcareous flushes, reed and sedge beds. These will have existing wildlife value and will already be excellent carbon stores. Tree planting could disturb soil and dry the area out which would result in releasing carbon.

Hedgerows
A survey is a good idea prior to any new planting to determine any existing value. There are often opportunities to plant new locally appropriate hedgerow trees or to broaden out sections to increase the structural complexity. New hedges can become sites for important local species like brown/black hairstreak butterflies as well as bats, small mammals and birds. Check old maps for lost hedge lines and prioritise those areas for planting.

Appendix 1

8. Objectives and Principles for Planting

Protect, Improve and Manage

Objective 1 – Manage our existing tree and vegetation resource according to best practice and improve vegetation health

- Existing trees are just as important as planting new.
- Benefits are not maximised from unhealthy trees.
- Healthy trees are more resilient to disease and pests.
- Healthy trees are more resilient to the effects of climate change.
- Healthy trees are safer.
- Larger, older trees are important carbon stores.
- Larger, older trees sustain and enhance urban biodiversity when maintained in good ecological condition.
- Natural regeneration should be the preferred approach where land is suitable and available especially when adjacent to diverse high-quality native woodland.
- Oxford has a wealth of historic, notable trees that have a heritage and cultural value.
- Larger, older trees provide more canopy cover.
- Trees with sufficient space for their roots are more resilient.
- Larger, older trees provide greater benefits from thermal cooling.
- Trees should only be felled if absolutely necessary. For example, if they are dead, dying, diseased, dangerous (and is posing an unacceptable risk to public safety) or damaging

property (e.g. subsidence when confirmed by technical evidence).

- Felled trees should always be replaced

Oxford City Council will lead by example in the management of our parks, street trees and housing stock. We will promote best practice guidance and a city wide approach.

What does this mean for you?

Individuals

- Interact with our urban forest, get involved in helping to manage and monitor it either at home or in your community.
- Protect and respect the trees and nature we already have.
- Individuals will be empowered with knowledge and support to effectively manage and monitor trees in private green spaces to bring them into better ecological condition.

Landowners and land managers

- We want a balanced approach to tree risk management to be taken across the city following best practice guidance.
- We want to encourage our landowners and land managers to take an asset management approach to their trees.
- Land managers/owners will be empowered with knowledge and support to effectively manage and monitor trees in private green spaces to bring them into better ecological condition.

Objective 2 - Improve biosecurity and manage ash dieback and other pests and diseases according to best practice

Appendix 1

Expand, Enhance and Develop

Objective 3 - Increase urban forest canopy cover using the right tree, right place principle

- Canopy cover increases with new planting and good management of existing trees.
- Long-term success of planting schemes depend on the right species being planted in the right places.
- To be successful tree planting schemes must plan beyond the planting stage and include measures to protect and nurture young trees for up to a minimum of 5 years.
- Creating the right conditions for natural regeneration, in the appropriate locations, is as important as new tree planting.
- Newly planted forests can enhance carbon sequestration capacity (by trees and in soils).
- To be successful, new planting schemes must involve local communities and stakeholders in the planning, planting and care of the tree to engender a sense of “ownership”.
- Community engagement and citizen science projects will be key to monitoring our progress

Oxford City Council will lead by example and will undertake actions to support this objective including developing a tree planting plan to assess land within the Council’s control for tree planting and natural regeneration potential. This tree planting plan can be made available to other landowners and manager to be used as a model to expand their own tree resource. The council will provide guidance on appropriate species, sites and maintenance for the wider community. The council will implement planning policy in the best

- Oxford risks losing 11% of its urban forest due to Ash dieback.
- Managing ash dieback properly and according to best practice – including identifying resistant individuals and avoiding preventative felling - can help reduce the spread of the disease.
- Healthy ash trees are more resistant to ash dieback.
- Influencing our supply chains can improve local and national biosecurity.
- Protecting our existing urban forest helps to retain and increase our canopy cover.

Oxford City Council will lead by example in the management of our parks, street trees and housing stock. We will promote best practice guidance and a city wide approach.

What does this mean for you?

Individuals

- Be aware of how you can avoid spreading pests and diseases when you travel to and from wooded areas.
- Learn to spot common diseases in trees and report them.

Landowners, land managers and businesses

- Become Plant Healthy certified to protect local and national biosecurity.
- Be part of a joined up approach to managing Ash dieback in Oxford.
- Be prepared when new threats become apparent and work together to ensure a joined up response.

Appendix 1

possible way to secure canopy cover gain through the planning system. The Council will monitor progress towards expanding and enhancing our urban forest and will involve key partners, stakeholders and encourage citizen science projects to help with monitoring and management.

What does this mean for you?

Individuals

- If appropriate, plant a tree or a hedgerow in your garden or encourage your employer to plant trees
- Get involved in a community tree planting project, or initiate one.

Landowners, land managers and businesses

- Assess your land for tree planting or natural regeneration potential in line with guidance.
- Support a community tree planting scheme either via offering up land or financial support for set up, maintenance and ongoing monitoring.

Objective 4 – Increase resilience through greater urban forest diversity

- Increased species diversity leads to increased resilience to climate change.
- Greater diversity provides resilience against pests and diseases.
- Diversity of age and size as well as species is also important for a healthy urban forest.

- Large trees need more space. Where there are opportunities for planting large trees such as oak and beech these should be prioritised.
- Large trees that grow to a great age provide opportunities for roosting and nesting, greater canopy cover and great value for their aesthetic and landscape value.
- Oxford has a large number of species present. However, three species dominate making it vulnerable.
- Increasing tree density in already wooded areas could increase canopy cover and species diversity.
- Different species have different carbon storage capabilities.
- Tree and shrub species should prioritise local species that insects, birds and other species are adapted to live on.
- Tree and shrub species should be chosen that provide food sources, shelter and breeding opportunities for a large variety of wildlife.

Oxford City Council will lead by example in our own operations and land management and will develop a set of principles for improved resilience to support other land managers and land owners in the city. We will seek to work with the arboricultural industry and local garden centres and nurseries to influence the type of species that are purchased and planted.

What does this mean for you?

Individuals

- If planting trees as part of a community group or private householder, make sure you are choosing an appropriate species.

Appendix 1

Landowners, land managers and businesses

- Be part of a joined up approach to trying to increase resilience in Oxford by adhering to any agreed principles and best practice guidance.
- Support citizen science projects by providing funding and taking part in citizen science monitoring programme.

Objective 5 – Prioritise areas where new tree and other vegetation planting benefits can be maximised

- Multiple benefits should be sought from new planting, balancing ecological and social benefits.
- In the first instance priority should be given to focusing on increasing canopy cover in the Nature Recovery Network and most deprived areas.
- Planting should involve increasing habitat diversity and connectivity combining quality and quantity.
- Taking an ecosystem service approach that balances biodiversity, carbon storage and other ecosystem services helps to identify and prioritise the benefits.
- Benefits such as reducing flooding, reducing urban heat island effect and improving air quality will need to be looked at in detail on a site specific basis.
- All opportunities to promote and realise health and well-being benefits should be taken.
- Engagement with communities, particularly schools and community groups, in more deprived areas of the city.

- In order to maximise community engagement, specific activities need to be targeted to engage communities where there is currently a low level of tree cover, providing outreach, engagement and learning opportunities – in particular working with schools and community groups in more deprived areas of the City.

Oxford City Council will assess potential for new planting as identified in the Trees for the Future opportunity maps. We will work with other landowners and stakeholders to prioritise these areas for planting. We will work with community groups to provide guidance and support to homeowners wishing to plant in their gardens or communities.

What does this mean for you?

Individuals

- Get involved with a local community group, encourage your community group to support other community groups e.g. for areas with high canopy cover your group could support other areas of Oxford with lower canopy cover.
- If appropriate, consider planting a tree within the curtilage of your house to provide shade to your house or hard landscaped areas. Encourage your employer or school to do the same.

Landowners, land managers and businesses

- Be part of a joined up approach to trying to increase canopy cover in prioritised areas.
- Consider helping to support projects that aim to help deprived areas increase their canopy cover.

- Be part of a joined up approach to promoting health and well-being benefits.
- Assess potential for planting on your land to address specific issues such as improving air quality, providing shade to buildings and hard landscaping or incorporating natural flood management.

Objective 6 – Improve biodiversity and contribute to nature recovery areas

- More, bigger, better, joined is the approach we need to take in order to halt biodiversity loss.
- Our urban forest can contribute to providing new habitat for wildlife and joining up habitats.
- Native species planting should be prioritised wherever possible.
- Where non-native trees are planted they should be near-native varieties with edible fruit, seeds or nectar.
- Tree and vegetation management should consider biodiversity. E.g. leaving fallen and standing deadwood wherever possible for the biodiversity benefits it brings and reducing over clearance of vegetation such as shrubs.
- Tree planting can be detrimental to habitats with existing biodiversity value as non-woodland habitats such as fens and flower rich grassland.

Oxford City Council can work with landowners who have land in the Nature Recovery Network to support them in what and where to plant.

Appendix 1

What does this mean for you?

Individuals

- Get involved in a local community group or join a conservation work party.
- Encourage more wildlife into your garden, plant a native tree.

Landowners, land managers and businesses

- Ensure biodiversity is built in to tree management plans and grounds management plans using best-practice guidance.

Objective 7 - Conserve and enhance landscape character

- Oxford's landscape and its relationship to the built environment is iconic.
- Potential land-use changes should consider impacts and seek opportunities to enhance Oxford's distinctive character.
- Oxford has a wealth of notable trees with a particular historic or cultural significance.
- Oxford has significant protected views and distinct character areas that should be considered when planting trees.

Oxford City Council can provide guidance to land managers and landowners on protecting and enhancing features of significance. We will help coordinate information on notable trees identified in the landscape character assessments and view cones studies and review plans for their management.

Appendix 1

What does this mean for you?

Individuals

- If you have a tree that contributes to the character of your area, consider planting an “understudy” tree.
- Get involved with helping us to celebrate our notable trees.

Landowners, land managers and businesses

- Ensure that tree management plans acknowledge the potential impact on landscape character and view cones.

Engage, Promote and Employ

Objective 8 - Engage with communities and key stakeholders

- Understanding the value of our urban forest is the first step in saving it.
- Engagement and creating a sense of ownership in communities is essential to successful management of our urban forest. Our trees need us and we need our trees.
- Our urban forest provides a space for our communities to come together as well as a reason for them to come together.
- A large proportion of our urban forest is on private land and out of the control of Oxford City Council.
- Working together with all our communities, landowners and stakeholders is essential for a coordinated citywide approach to care and monitoring.
- We can divide our stakeholders into the landowning groups, the supply chain, the implementers and the maintainers.

Oxford City Council will reach out to our communities through our community organisations and networks and to individual citizens, to involve our stakeholders and communities in the delivery of the strategy.

What does this mean for you?

Individuals

- Get involved in a local community group, join a conservation work party.
- Get out into your local park and enjoy the trees.
- Plant a tree in your garden – follow the Right Tree, Right Place approach
- Wildlife-friendly gardening

Landowners, land managers and businesses

- Encourage landowners to plant trees in appropriate areas on their land – follow the Right Tree, Right Place approach
- Provide communities with opportunities, such as providing land and/ or support for developing initiatives.

Objective 9 – Understand the value of our urban forest and create opportunities to reap economic benefits from it

- Economic benefits of urban forest include: by-products (timber, mulch and fruit), tourism, increased property values and increased inward investment.

Appendix 1

- Improving environmental quality, reducing impacts such as flooding and improving mental and physical health can have indirect economic benefits.
- Trees should be valued as assets, giving them a financial worth.
- Commercial forestry is not likely to be appropriate in an Oxford context but opportunities exist for green waste management etc.
- Tourism is important for the local economy. The quality of our local environment is fundamental to its attractiveness as a place to visit.
- Woodland management can be significantly cheaper than maintaining some types of grassland.

Oxford City Council will continue to develop the benefits of tourism to our city. We will explore opportunities for generating income from our urban forest.

What does this mean for you?

Individuals

- Get involved with local initiatives to plant trees in your area.

Landowners, land managers and businesses

- Explore opportunities for generating income from your land.
- Value the economic benefit that trees provide to your area/business.
- Take an asset management approach to managing your trees.



Blackbird Leys Park Copse

Appendix 1

9. Implementation

9.1. Tree management and responsibilities

Trees in private ownership are the responsibility of the landowner. Oxford City Council has a Tree Management Policy²⁵ which relates to the practical management of trees owned by the City Council. Most institutions and landowners will have their own management plans that relate specifically to the trees they own. Most street trees are owned by Oxfordshire County Council as the Highways Authority.

The Council's Planning Department manage the controls for trees that are covered by Tree Preservation Orders (TPOs) or where they are protected through Conservation Areas. Tree Protection Orders are made to protect individual trees or groups of trees that provide a significant amenity benefit to an area.

The City and County Councils can also create and influence policy in this area for example through Local Plan Policy making or Green Infrastructure Strategies. Oxford City Council planning policy requires new developments to demonstrate an increase in overall canopy cover and there are also requirements with regards to net gain and off-site compensation measures. Net gain is where development leaves biodiversity in a better state than it was before. The net gain concept comes from national planning policy and is a key principle of the Government's 25-year Environment Plan. Any development in Oxford that will result in negative impacts on biodiversity must demonstrate how an overall net gain will be achieved.²⁶

There are also duties to protect legally protected nature sites such as Ancient Woodland. For more information see Appendix 2 for a table showing the variety of organisations who are involved in caring for our urban forest.

9.2. What's already going on?

Lots of great action has been going on in Oxford over the last few years to celebrate and support our urban forest. We are not starting from scratch with this strategy. In the last five years, Oxford City Council, with the help of local communities, has planted over 7000 new trees. Community organisations are also very active for example, Low Carbon West Oxford have planted over 2000 trees and have developed a local tree walk guide to the trees in the local area.



Earthwatch Tiny Forest Foxwell Drive, January 2021

There are also community groups setting up community orchards and "tiny forests"²⁷, an initiative led by the Earthwatch Institute. Two

Appendix 1

tiny forests have been planted at Meadow Lane Nature Reserve and Foxwell Drive to help preserve and promote biodiversity in the city. These tiny forests are about the size of a tennis court and will contain about 600 trees each.

There is also the ongoing amazing work of all the volunteers who participate in work parties to help manage sites such as our ancient woodland at Shotover. Whilst there is a great deal of energy and positive activity we must be aware of the significant threats that our urban forest faces.

9.3. Funding

Achieving the aims of this strategy and securing the future of our urban forest depends on ongoing financial support from key stakeholders in the public sector, the private sector, including developers, businesses and landowners and also from the wider community. Council budgets are tight owing to central government underfunding so we need our communities and businesses to help us share the cost and help us to deliver the strategy. We will all benefit from our collective effort.

Understanding the costs involved in successful planting projects tree stock is vital, in particular, ensuring that ongoing maintenance is accounted and planned for.

The City Council and its wholly owned company, Oxford Direct Services (ODS) will continue to manage our parks and street trees

and will continue to source funding whenever it becomes available. For the many community groups that are already doing such great work in this area, the funding that they bring in for planting management work is also vital. It is hoped that this strategy will help to align many of these projects to help us to work towards a common goal.

9.4. Monitoring and Review

The strategy will be reviewed every 10 years. In this process the question of “what have we got?” will be revisited. The canopy cover assessment will be repeated using iTree or similar. This process will enable us to check progress against our objectives, assess what approaches or projects were successful and where improvements could be made. The review process will involve the key stakeholders and will invite engagement from our communities.

9.5. Delivery and next steps

This strategy seeks to set a high level strategic direction for the city. Key stakeholders and our communities have been involved in developing this strategy.

There are so many great projects and initiatives already occurring in Oxford that we have a great base to build on. The next steps will be dependent on achieving external funding opportunities to implement the steps as set out in the table below.

Appendix 1

Next steps and initial actions in achieving the vision

- 1. Better coordinate projects across the city and engage more stakeholders**
Coordinating projects and stakeholders will require resources. External funding will be needed to establish a coordinator role working with partners and communities to deliver the aims of the strategy.
- 2. Develop a detailed planting plan working collaboratively with our partners, communities and stakeholders**
The detailed planting plan will set a realistic target based on identified planting opportunities and mechanisms for delivering them. It will use state of the art tree planting guidance and data from the Oxfordshire Treescape Opportunity Mapping Project.
- 3. Ensure that the planning system is being used to its full extent to deliver the aims of the strategy**
Developers will ensure species choices for new developments are aligned with detailed planting plans and will deliver well designed habitat networks. Net gain and compensation opportunities will be maximised wherever possible.
- 4. Address funding constraints for street tree planting and maintenance by exploring novel funding mechanisms**
Oxford City Council and Oxford Direct Services are responsible for managing and maintaining our street tree stock. Opportunities for increasing canopy cover through street trees is currently being explored, such as through community tree sponsorship schemes. Such schemes will enable multiple objectives to be achieved by engaging the community in increasing our canopy cover within particular treescapes.

127

Appendix 1 Plans, Policies, Guidance and Influencing Strategies

- Oxfordshire's Forthcoming Nature Recovery Strategy
- Oxfordshire's Forthcoming Environmental Investment Strategy
- Urban Forestry and Woodlands Advisory Committee (FWAC)
- Oxford's Local Plan 2016 -2036
- Technical Advice Note (Trees)
- [Oxford City Council Tree Management Policy 2016](#)
- Oxford's Sustainability Strategy
- [Oxford City Council Response to Citizen's Assembly 2019](#)
- Oxfordshire Joint Health and Wellbeing Strategy (2018 – 2023)
- Oxford Transport Strategy (Volume 8 of the LTP)

Appendix 1

- Oxford Local Cycling and Walking Investment Plan (LCWIP)
- Oxford Green Spaces Strategy (2013 – 2027)
- Oxford Biodiversity Strategy
- Flooding/Suds
- Air Quality Action Plan
- Oxfordshire Energy Strategy

- [Oxford Landscape Character Assessment](#)
- [Biodiversity Review for Oxford City Council Parks and Nature Areas 2020](#) – A review of biodiversity and habitat management in Oxford City Council's Green Spaces, and a proposal of actions for further improvements.

Appendix 1

Appendix 2 - Who is responsible for our urban forest?

129

	Policy Makers	Landowners	Managers and Maintainers	Planters	The Supply Chain	Advisors
Oxford City Council and Oxford Direct Services ²⁸	✓	✓	✓	✓		
Oxfordshire County Council	✓	✓	✓	✓		
Institutional land (universities, schools, hospitals etc.)		✓	✓	✓		
Local businesses		✓	✓	✓		
Developers				✓		
Private householders		✓	✓	✓		
Individuals		✓	✓	✓		
Community Groups			✓	✓		
Nurseries and garden centres					✓	
Arboricultural Industry (tree surgeons, landscape gardeners etc.)			✓	✓		
Network Rail		✓	✓	✓		
Canals and Rivers Trust		✓	✓	✓		
Environment Agency		✓	✓			
BBOWT						✓
Oxfordshire Treescape Opportunity Mapping Project						✓
TDAG						✓

Appendix 1

References

¹ Oxford Citizens' Assembly on Climate Change
https://www.oxford.gov.uk/info/20011/environment/1343/oxford_citizens_assembly_on_climate_change

² Net Zero – any carbon emissions are balanced by absorbing an equivalent amount of carbon dioxide from the atmosphere. The UK Government has legislated that the UK will reach net zero by 2050. In 2019 Oxford City Council held a Citizen's Assembly to discuss how Oxford can achieve net zero. The Council's response can be found in this [report](#).

³ [The Greater Lyon Tree Charter](#)

⁴ [The Woodland Trust](#)

⁵ [Trees and Design Action Group](#) (TDAG)

⁶ For more information on the Zero Carbon Oxford Partnership and the full list of members go to:
https://www.oxford.gov.uk/news/article/1764/council_outlines_next_steps_for_zero_carbon_oxford_partnership

⁷ Oxford i-Tree Canopy Cover Assessment 2015
<https://www.treeconomics.co.uk/projects/oxford-i-tree-canopy-cover-assessment/>

⁸ Oxford iTree ECO study
https://www.oxford.gov.uk/info/20198/trees_woodlands_and_hedges/1348/oxford_i-tree_eco_study

⁹ <https://www.nationaltrust.org.uk/press-release/new-research-shows-55bn-fund-needed-to-level-up-access-to-urban-green-space-as-part-of-uks-green-recovery>

¹⁰ [Climate Emergency Strategy Support Report 2019](#) produced by Anthesis as background for the Oxford City Council Citizens' Assembly on Climate Change.

¹¹ [Air Quality Action Plan](#) -
https://www.oxford.gov.uk/downloads/download/133/air_quality_action_plan

¹² <https://laqm.defra.gov.uk/laqm-faqs/faq105.html>

¹³ [Impacts of Vegetation on Urban Pollution, DEFRA Air Quality Expert Group](#)

¹⁴ Thames Valley Environmental Records Centre (TVERC), Wild Oxfordshire and The Berks, Bucks and Oxon Wildlife Trust (BBOWT) and overseen by Oxfordshire's Biodiversity Advisory Group (BAG). It has been adopted by the Oxfordshire Environment Board (OxEB).

¹⁵ <https://www.wildoxfordshire.org.uk/biodiversity/river-catchments/evenlode-catchment/projects/river-restoration-including-water-quality-natural-flood-management-measures/>

¹⁶ Land adjacent to a river or stream

¹⁷ 3D buffer strips – designed to deliver more for the environment October 2020, Environment Agency

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/928117/3D_buffer_strips_designed_to_deliver_more_for_the_environment_-_summary.pdf

¹⁷ www.urbanbees.co.uk/trees/trees.htm

¹⁸ Oxford View Study

https://www.oxford.gov.uk/info/20064/conservation/876/oxford_views_study

¹⁹ www.urbanbees.co.uk/trees/trees.htm

²⁰ Woodland Trust "Trees or Turf? Best value in managing urban green space" <https://www.woodlandtrust.org.uk/media/1828/trees-or-turf-for-urban-green-space.pdf>

²¹ Wolf, Kathleen "Business district streetscapes, trees and consumer response" Journal of Forestry

http://www.naturewithin.info/CityBiz/BizTreesAll_JFor.pdf

²² [Index of Multiple Deprivation Oxford Report 2019](#)

²³ [Poverty and Mental Health](#), Mental Health Foundation

²⁴ The map data has used Lower Layer Super Output Areas (LSOAs) which are a geographic hierarchy for reporting statistics in small areas.

²⁵ Oxford City Council Tree Management Policy -

https://www.oxford.gov.uk/downloads/file/1907/tree_management_policy

²⁶ Oxford City Council Technical Advice Note – Green Spaces

file:///C:/Users/egreen2/Downloads/TAN_9_GREEN_SPACES_following_comments_v2.pdf

²⁶ <https://earthwatch.org.uk/get-involved/tiny-forest>

Appendix 1

²⁷Oxford Direct Services (ODS) is a social enterprise wholly owned by Oxford City Council. ODS is responsible for delivering council services

such as parks maintenance and street tree maintenance and management.

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