



# **GREEN & BLUE INFRASTRUCTURE**



Waltham Forest Infrastructure Delivery Plan 2020

# 18. Open Space

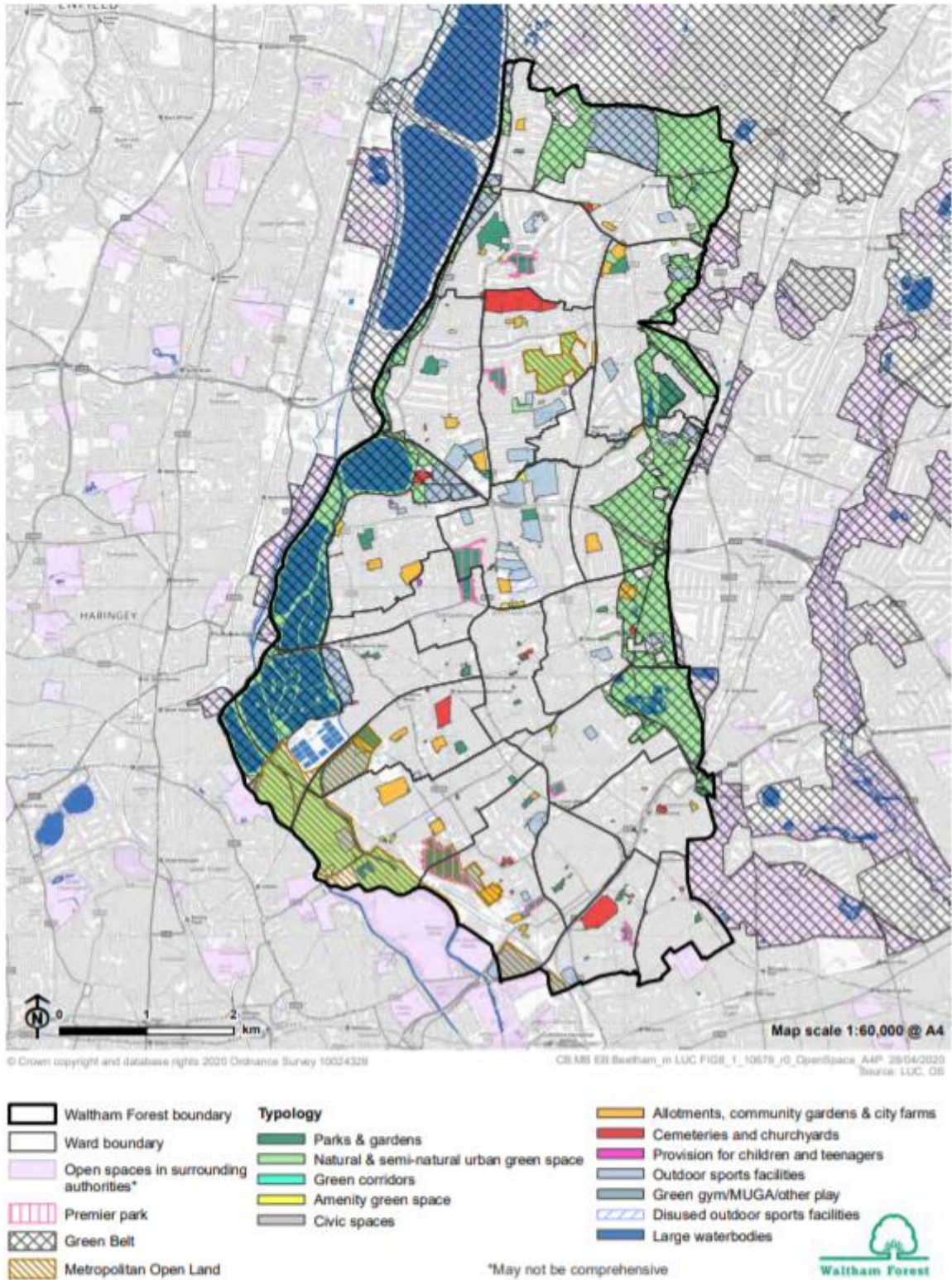
## Introduction

- 18.1 There are 1,202.2 ha of open space within the borough, made up of a range of typologies. The greatest quantity of open space falls within the natural and semi-natural urban greenspace typology covering an area of 786.3 ha. The boroughs two regional parks (Lee Valley and Epping Forest) make up the majority of this.
- 18.2 The Open Space Needs Assessment<sup>1</sup> identified 194 open spaces in the borough covering a range of different 'typologies' of open space. Natural and Semi-Natural Urban Green Space makes up the largest percentage of open space in the borough 81%. This is followed by Parks and Gardens 9% and then Allotments, Community Gardens and City Farms (5%), see figure 18.1 and 18.4 below.
- 18.3 The Council has designated seven open spaces as 'Premier Parks', which are considered to be the borough's most high-profile open spaces, these are:
- Abbots Parks
  - Coronation Gardens
  - Langthorne Park
  - Lloyd & Aveling Park
  - Memorial Park
  - Ridgeway Park
  - Leyton Jubilee Park
- 18.4 There are a number of significant open spaces that fall completely within the borough boundary such as Walthamstow Wetlands, with larger sites only falling partially within the boundary such as Epping Forest and Lee Valley.
- 18.5 Regional Park. Several large and strategically important open spaces are also located outside the borough to the south, including:
- Millfields – Hackney Marshes
  - Queen Elizabeth Olympic Park
- 18.6 A total of 27% of the borough is designated as either Metropolitan Open Land (MOL) or Green Belt (GB), concentrated mainly on the western aspect. These areas are recognised as playing a strategically important role in controlling urban growth and maintaining the structure of the built environment by providing gaps of open space between settlements. The benefits and opportunities of GB and MOL also include providing opportunities for access to open spaces for recreation, sport and nature conservation interest for the urban population.

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<sup>1</sup>[https://www.walthamforest.gov.uk/sites/default/files/WF%20Open%20Space%20Needs%20Assessment%202019%20Update\\_WEB.pdf](https://www.walthamforest.gov.uk/sites/default/files/WF%20Open%20Space%20Needs%20Assessment%202019%20Update_WEB.pdf)

Figure 18.1: Open Space by Typology in Waltham Forest



## Legislation

18.7 The provision of open spaces and recreation facilities is central to a sustainable and thriving community. It is widely recognised that the provision of high-quality public

realm can help promote an area as an attractive place to live and can result in a number of wider benefits.

- 18.8 The National Planning Policy Framework, 2019 (NPPF) recognises the importance of access to high quality open spaces for the health and wellbeing of communities and provides the rationale for the preparation of open space strategies. Paragraph 20 states that:

*'Strategic Policies should set out an overall strategy for the pattern, scale and quality of development, and make sufficient provision for...conservation and enhancement of the natural, built and historic environment, including landscapes and green infrastructure.'*

- 18.9 The NPPF also requires that planning policies are based on:

*'robust and up-to-date assessments of the need for open space, sport and recreation facilities (including quantitative or qualitative deficits or surpluses) and opportunities for new provision.'* (Paragraph 96).

- 18.10 Although the NPPF has replaced PPG17, the PPG17 Companion Guide (Assessing needs and opportunities: a companion guide to PPG17, ODP, 2002) still provides a valuable and useful framework upon which to base assessments and subsequently local planning policies.

- 18.11 The National Planning Practice Guidance sets out that:

*"Open space should be taken into account in planning for new development and considering proposals that may affect existing open space. Open space can provide health and recreation benefits to people living and working nearby; have an ecological value and contribute to green infrastructure, as well as being an important part of the landscape and setting of built development, and an important component in the achievement of sustainable development."*

- 18.12 The 25 Year Environment Plan (2018) sets out the government's approach to protecting the environment and recognises the social, economic and environmental benefits of the provision of green infrastructure. The plan sets out commitments to 'green our towns and cities by creating green infrastructure and planting one million urban trees' and 'producing stronger new standards for green infrastructure.'

- 18.13 The Plan highlights the general social benefits of access to greenspace and commits to further incorporate access to the natural environment into local Health and Wellbeing Board strategies. Under the Goal of 'Enhancing beauty, heritage and the natural environment', the Plan states that action will include: 'Making sure that there are high quality, accessible, natural spaces close to where people live and work, particularly in urban areas, and encouraging more people to spend time in them to benefit their health and wellbeing'. The Environment (Principles and Governance) Bill will give the 25 Year Environment Plan Statutory status and support the delivery of the Government's manifesto commitments relating to the environment.

- 18.14 There is increasing recognition of the value of green infrastructure and open spaces in delivering a range of benefits e.g. health, water quality, flood management, air quality, climate regulation and biodiversity. The Council has prepared a Green and Blue Infrastructure Study/Strategy (2020), details of which are included in [Chapter 23](#).
- 18.15 The recent (July 2017) Park Life report from the London Assembly Environment Committee<sup>2</sup> has once again drawn attention to the importance of green spaces to Londoners.
- 18.16 Key documents which promote the provision of green infrastructure in London include:
- Draft New London Plan<sup>3</sup>
  - Natural Capital Account for London<sup>4</sup>.
  - London Environment Strategy<sup>5</sup>.
  - The London Infrastructure Plan 2050<sup>6</sup>.
  - Enabling Infrastructure: Green Energy, Water and Waste Infrastructure to 2050<sup>7</sup>.
  - All London Green Grid (ALGG) - Supplementary Guidance to the London Plan. Waltham Forest falls into two Green Grid Areas (GGAs): 1. Lee Valley and Finchley Ridge and 2. River Roding and Epping Forest.<sup>8</sup>

### Open Space Methodology

- 18.17 The method for this assessment reflects the requirements of the NPPF and draws on the quality evaluation guidelines developed through the Green Flag Award initiative. The method is informed by the Mayor’s Guidance on the preparation of open space studies. The open space categories are set out in Table 18.2.
- 18.18 Figure 18.3 shows the neighbourhood areas used for the purposes of the boroughs open space assessment.

Table 18.2: Open Space typology definitions

| Type of open space   | Primary purpose  |
|----------------------|--|
| A. Parks and gardens | Accessible, high quality opportunities for informal recreation and community events. More multi-functional than other open space, offering space for quiet relaxation as well as a |

<sup>2</sup> [https://www.london.gov.uk/sites/default/files/environment\\_committee\\_-\\_park\\_life\\_report.pdf](https://www.london.gov.uk/sites/default/files/environment_committee_-_park_life_report.pdf)

<sup>3</sup> <https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan>

<sup>4</sup> <https://www.london.gov.uk/what-we-do/environment/parks-green-spaces-and-biodiversity/green-infrastructure/natural-capital-account-london?source=vanityurl>

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

<sup>6</sup> <https://www.london.gov.uk/what-we-do/business-and-economy/better-infrastructure/london-infrastructure-plan-2050>

<sup>7</sup> <https://www.london.gov.uk/what-we-do/business-and-economy/better-infrastructure/london-infrastructure-current-focus-areas>

<sup>8</sup> <https://www.london.gov.uk/WHAT-WE-DO/environment/environment-publications/all-london-green-grid-and-area-frameworks>

| Type of open space                      | Primary purpose   |
|---|---|
|   | range of amenities and activities for visitors. In particular parks and gardens often include children's play, youth and/or outdoor sports facilities.  |
| B. Natural and semi-natural green space | Wildlife conservation, biodiversity and environmental education awareness.  |
| C. Green corridor                       | Walking, cycling or horse riding, whether for leisure purposes or travel, and opportunities for wildlife migration.   |
| D. Amenity Green Space                  | Opportunities for informal activities close to home or work. Amenity Green Spaces provide a less formal green space experience than parks and gardens, and generally provides fewer habitats. |
| E. Allotments                           | Opportunities for those people who wish to do so to grow their own produce as part of the long term promotion of sustainability, health and social inclusion.                                 |
| F. Cemeteries and Churchyards           | Quiet contemplation and burial of the dead, often linked to the promotion of wildlife conservation and biodiversity.  |
| G. Civic Space                          | Providing a setting for civic buildings and community events.   |
| H. Provision for Children and Teenagers | Areas designed primarily for play and social interaction involving children and young people, such as equipped play areas, ball courts, skateboard areas and teenage shelters.                |
| I. Outdoor Sports Provision             | Participation in outdoor sports, such as pitch sports, tennis, bowls, athletics, or countryside and water sports.   |

18.19 It is also helpful to categorise open space by size, as this influences the functions it can provide to a community, as well as the distance that people are likely to travel to use it. The London Mayor's Guidance for open space strategies (and the New London Plan Consultation draft) are considered the most appropriate for the Borough. Small sites and Pocket parks have been combined into a 'small local sites' level as shown below:

1. Regional Parks (400ha+)
2. Metropolitan sites (60-400ha)
3. District sites (20-60ha)
4. Local sites (2-20ha)
5. Small local sites (<2ha)
6. Linear open spaces (variable size)<sup>9</sup>

Figure 18.3: Neighbourhood areas used for Open Space analysis

<sup>9</sup> For the purpose of this study, Linear open spaces are the same as those identified as the Green Corridor typology.

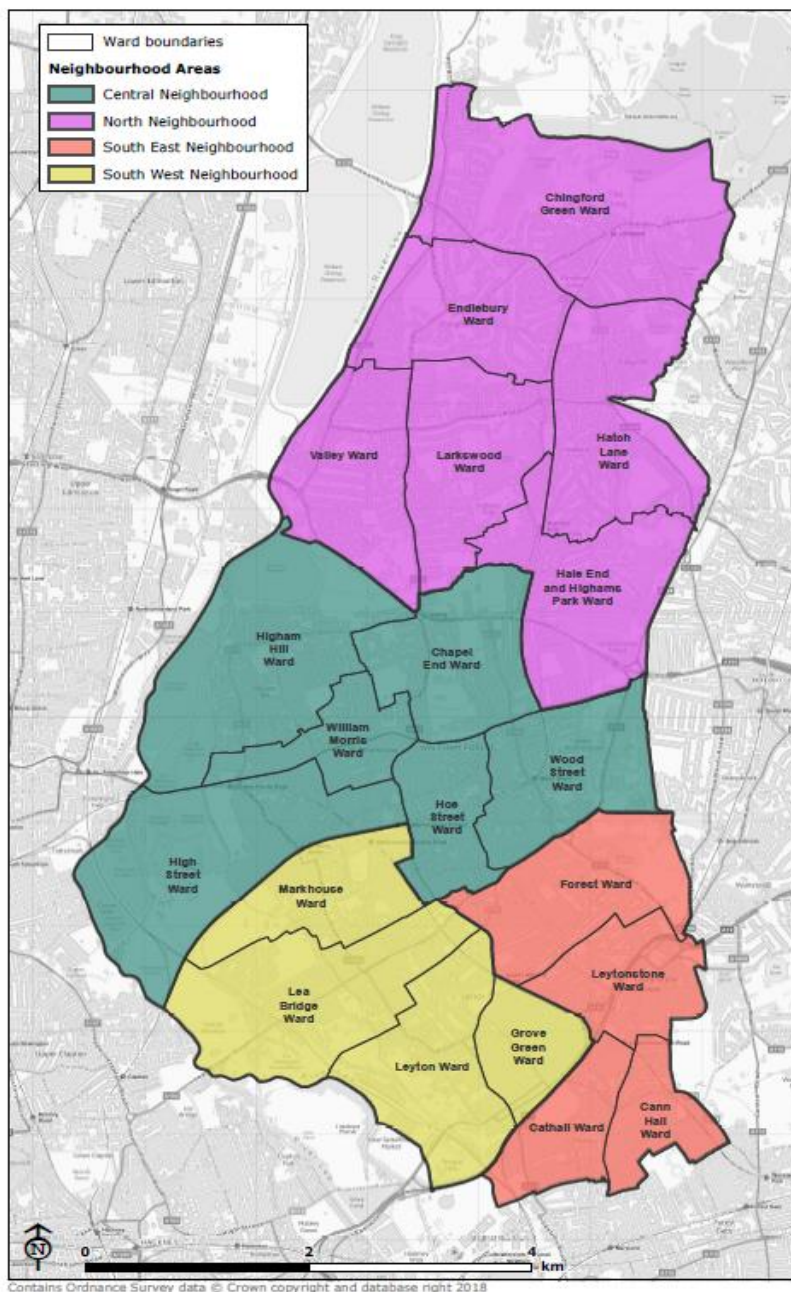


Figure 18.4: Open Space by Typology in Waltham Forest

| Primary typology                         | Area (ha) | Number of sites | Example sites   |
|--|-----------|-----------------|---|
| Parks & Gardens                          | 83.8      | 33              | Lloyd and Aveling Park<br>St James Park<br>Leyton Jubilee Park<br>Mansfield Park<br>Ridgeway Park |
| Natural & Semi-Natural Urban Green Space | 800.9     | 15              | The Copse<br>Greenway Avenue Nature Reserve<br>Low Hall Conservation Area                         |

| Primary typology                           | Area (ha)  | Number of sites | Example sites   |
|--|------------|-----------------|---|
|  |            |                 | Newport School Nature Area<br>Pimp Hall Nature Reserve  |
| Green Corridors                            | 2.9        | 5               | The Linear Park<br>River Ching<br>The Ching and Brookfield Meadow<br>Ching Walkway<br>River Ching   |
| Amenity Green Space                        | 6.1        | 22              | Knotts Green<br>Leyton Green<br>Leyton Relief<br>Chingford War Memorial<br>Cathall Road   |
| Allotments, Community Gardens & City Farms | 51.4       | 38              | Auckland Road Allotment Site<br>Bateman Road Allotments<br>Beechwood Allotments<br>Brookfield Allotment Site                                  |
| Cemeteries and Churchyards                 | 36.5       | 10              | St Peters & St Paul Churchyard<br>St Mary's Churchyard<br>St Peters in the Forest Churchyard<br>Queens Road Cemetery<br>All Saints Churchyard |
| Civic Spaces                               | 0.4        | 1               | Walthamstow Town Square   |
| Provision for Children and Teenagers       | 2.3        | 21              | Harrow Road Park<br>Greenleaf Road Playground<br>Priory Court Playground<br>Coppermill Park<br>Nursery play area<br>Queens Road Playground    |
| Outdoor Sports Facilities                  | 212.7      | 46              | Parmiters and Cavendish Sports Ground<br>Peter May Sports Centre<br>Rolls Sports Ground<br>Royal Epping Forest Golf Club                      |
| <i>Disused Outdoor Sports Facilities</i>   | <i>5.1</i> | <i>3</i>        | <i>Chingford Football Ground</i>  |
| Waltham Forest                             | 1202.2     | 194             |   |

Table 18.5: Quantity of public open space by Neighbourhood Area

| Primary typology (whole sites) | South Neighbourhood | Central Neighbourhood | North Neighbourhood | Waltham Forest |
|--------------------------------|---------------------|-----------------------|---------------------|----------------|
|--------------------------------|---------------------|-----------------------|---------------------|----------------|



|  |              |            |              |              |
|--|--------------|------------|--------------|--------------|
| Parks & Gardens                            | 29.6         | 21         | 33.2         | <b>83.8</b>  |
| Natural & Semi-Natural Urban Green Space   | 143.2        | 336.3      | 321.4        | <b>801</b>   |
| Green Corridors                            | 0.5          | 0.4        | 2            | <b>2.9</b>   |
| Amenity Green Space                        | 1.7          | 2.4        | 2            | <b>6.1</b>   |
| Allotments, Community Gardens & City Farms | 21.7         | 12.3       | 17.5         | <b>51.4</b>  |
| Cemeteries and Churchyards                 | 15.3         | 3.7        | 17.5         | <b>36.5</b>  |
| Civic Spaces                               | 0            | 0.4        |              | <b>0.4</b>   |
| Provision for Children and Teenagers       | 0.9          | 0.8        | 0.6          | <b>2.3</b>   |
| Outdoor Sports Facilities                  | 49.4         | 66.2       | 95           | <b>210.5</b> |
| <i>Disused Outdoor Sports Facilities</i>   | 1.5          | 3.6        |              | <b>5.1</b>   |
| <b>Waltham Forest</b>                      | <b>263.8</b> | <b>447</b> | <b>489.2</b> | <b>1200</b>  |

Figure 18.6: Quantity (ha) of open space by primary typology in each Neighbourhood Area

| Primary typology (whole sites)             | Central Neighbourhood | North Neighbourhood | South East Neighbourhood | South West Neighbourhood | Waltham Forest |
|--|-----------------------|---------------------|--------------------------|--------------------------|----------------|
| Parks & Gardens                            | 21.0                  | 33.2                | 5.2                      | 24.4                     | 83.8           |
| Natural & Semi-Natural Urban Green Space   | 336.3                 | 321.4               | 74.4                     | 68.8                     | 801.0          |
| Green Corridors                            | 0.4                   | 2.0                 |                          | 0.5                      | 2.9            |
| Amenity Green Space                        | 2.4                   | 2.0                 | 1.1                      | 0.6                      | 6.1            |
| Allotments, Community Gardens & City Farms | 12.3                  | 17.5                | 0.9                      | 20.8                     | 51.4           |
| Cemeteries and Churchyards                 | 3.7                   | 17.5                | 10.0                     | 5.3                      | 36.5           |
| Civic Spaces                               | 0.4                   |                     |                          |                          | 0.4            |
| Provision for Children and Teenagers       | 0.8                   | 0.6                 | 0.6                      | 0.3                      | 2.3            |
| Outdoor Sports Facilities                  | 66.2                  | 95.0                | 7.2                      | 42.2                     | 210.5          |

| Primary typology (whole sites)           | Central Neighbourhood | North Neighbourhood | South East Neighbourhood | South West Neighbourhood | Waltham Forest |
|--|-----------------------|---------------------|--------------------------|--------------------------|----------------|
| <i>Disused Outdoor Sports Facilities</i> | 3.6                   |                     |                          | 1.5                      | 5.1            |
| Waltham Forest                           | 447.0                 | 489.2               | 99.4                     | 164.4                    | 1200.0         |

18.20 Figure 18.7 shows the breakdown when considering the contribution that secondary typologies make to the overall provision of each type of open space. For example, this presents the area of parks and gardens once areas of play, outdoor sports facilities and natural and semi-natural green spaces are removed and added to their own relevant typology. In addition, this table also identifies the relative proportion of natural and semi-natural green space that is inland water (reservoirs in Lee Valley and large waterbodies in Epping Forest).

Table 18.7: Quantity (ha) of open space by secondary typology

| Site Components (primary and secondary typology) | Central Neighbourhood | North Neighbourhood | South East Neighbourhood | South West Neighbourhood | Waltham Forest |
|--|-----------------------|---------------------|--------------------------|--------------------------|----------------|
| Parks & Gardens                                  | 18.5                  | 31.0                | 4.2                      | 7.9                      | 61.6           |
| Natural & Semi-Natural Urban Green Space         | 162.8                 | 316.7               | 66.6                     | 77.4                     | 623.5          |
| <i>Large waterbodies</i>                         | 173.3                 |                     | 7.8                      | 2.3                      | 183.4          |
| Green Corridors                                  | 0.4                   | 2.0                 |                          | 0.5                      | 2.9            |
| Amenity Green Space                              | 2.4                   | 2.0                 | 1.1                      | 0.6                      | 6.1            |
| Allotments, Community Gardens & City Farms       | 12.3                  | 17.5                | 0.9                      | 21.9                     | 52.6           |
| Cemeteries and Churchyards                       | 3.7                   | 17.5                | 10.0                     | 5.3                      | 36.5           |
| Civic Spaces                                     | 0.4                   |                     |                          |                          | 0.4            |
| Provision for Children and Teenagers             | 2.4                   | 1.6                 | 1.3                      | 2.7                      | 8.0            |
| Outdoor Sports Facilities                        | 67.3                  | 100.9               | 7.5                      | 44.3                     | 219.9          |
| <i>Disused Outdoor Sports Facilities</i>         | 3.6                   |                     |                          | 1.5                      | 5.1            |
| Waltham Forest                                   | 447.0                 | 489.2               | 99.4                     | 164.4                    | 1,200.0        |

18.21 As can be seen in the table above, water in Lee Valley and Epping Forest makes up over 20% of the natural and semi-natural urban green space provision. It should also be noted that around 25% of parks and gardens are supporting uses such as play and sport.

### Open Space Accessibility

18.22 Of the above sites, not all of the provision is accessible to the public. For the purposes of this assessment. Sites categorised as publicly accessible are those that are freely accessible or those that are accessible with opening hours restrictions. Sites are considered to be ‘not publicly accessible’ if they have other restrictions on access or are completely closed to the public.

18.23 Figure 18.8 shows the accessibility of open spaces audited for Open Space Study 2019. The main type of restriction for sites with ‘restricted public access’ is opening hours. In the case of allotments and community gardens, these are usually restricted to tenants/members.

Figure 18.8: Summary of accessibility of sites (by primary typology)

| Primary typology                           | Freely accessible to public | Majority freely accessible with some restricted areas | Restricted public access | No public access | Accessibility not assessed | Total |
|--|-----------------------------|---|--------------------------|------------------|----------------------------|-------|
| Parks & Gardens                            | 53.2                        | 3.3   | 27.4                     |                  |                            | 83.8  |
| Natural & Semi-Natural Urban Green Space   | 792.0                       | 0.7   | 8.1                      | 0.2              |                            | 801.0 |
| Green Corridors                            | 2.1                         | 0.4   | 0.5                      |                  |                            | 2.9   |
| Amenity Green Space                        | 5.9                         |   |                          | 0.2              |                            | 6.1   |
| Allotments, Community Gardens & City Farms |                             |   | 51.4                     |                  |                            | 51.4  |
| Cemeteries and Churchyards                 | 2.2                         |   | 34.3                     |                  |                            | 36.5  |
| Civic Spaces                               | 0.4                         |   |                          |                  |                            | 0.4   |
| Provision for Children and Teenagers       | 1.0                         |   | 1.1                      | 0.2              |                            | 2.3   |
| Outdoor Sports Facilities                  |                             |   |                          |                  | 210.5                      | 210.5 |
| Disused Outdoor Sports Facilities          |                             |   |                          |                  | 5.1                        | 5.1   |

| Primary typology | Freely accessible to public | Majority freely accessible with some restricted areas | Restricted public access | No public access | Accessibility not assessed | Total  |
|------------------|-----------------------------|---|--------------------------|------------------|----------------------------|--------|
| Waltham Forest   | 856.8                       | 4.4   | 122.8                    | 0.5              | 215.7                      | 1200.0 |

18.24 Figure 18.9 shows how the publicly accessible open spaces are distributed between the four Neighbourhood Areas used for the study. Only sites that are not publicly accessible or where accessibility was not assessed (outdoor sports facilities) have been excluded.

Figure 18.9: Quantity of publicly accessible open space by Neighbourhood Area

| Primary typology                              | Central Neighbourhood | North Neighbourhood | South East Neighbourhood | South West Neighbourhood | Waltham Forest |
|---|-----------------------|---------------------|--------------------------|--------------------------|----------------|
| Parks and gardens                             | 21.0                  | 33.2                | 5.2                      | 24.4                     | 83.8           |
| Natural and semi-natural greenspace           | 336.3                 | 321.4               | 74.4                     | 68.6                     | 800.8          |
| Green corridor                                | 0.4                   | 2.0                 |                          | 0.5                      | 2.9            |
| Amenity greenspace                            | 2.4                   | 2.0                 | 1.1                      | 0.5                      | 5.9            |
| <i>Allotments (not audited, but included)</i> | 12.3                  | 17.5                | 0.9                      | 20.8                     | 51.4           |
| Cemeteries and churchyards                    | 3.7                   | 17.5                | 10.0                     | 5.3                      | 36.5           |
| Civic space                                   | 0.4                   |                     |                          |                          | 0.4            |
| Provision for children and young people       | 0.8                   | 0.6                 | 0.6                      | 0.1                      | 2.1            |
| Waltham Forest                                | 377.3                 | 394.2               | 92.3                     | 120.2                    | 983.9          |

### The Impact of Growth to 2035

18.25 The Open Space Study 2019 recommends the following future standard for open space provision in the borough (see Figure 18.10).

Table 18.10: Proposed Open Space standard for Waltham Forest to 2035<sup>10</sup>

| Typology          | Proposed standard | Justification   |
|-------------------|-------------------|---|
| Public Open Space | 1.6ha/1000 people | Based on an assessment of the current levels of provision, adjusted to reflect the much higher levels of provision in the North Neighbourhood |

<sup>10</sup> Waltham Forest Open Space Study, LUC, 2019

|  |  |   |
|--|--|---|
|  |  | compared to the other three Neighbourhood areas. Comparable to existing standard. |
|--|--|---|

18.26 Figure 18.11 shows this provision alongside current and future population figures (based on GLA 2017-based BPO medium out-migration scenario figures) to understand what the relative provision per 1000 people is across the borough and at Neighbourhood Area level. At borough level, current provision (across these three key typologies) is 2.5 ha per 1000 people. Whilst provision per 1000 people in the North Neighbourhood Area is significantly higher than the borough average, the three remaining Neighbourhood Areas fall below this figure.

Table 18.11: Provision of public open space per 1000 people against proposed standard of 1.6ha/1000 people (GLA 2017-based BPO low (LO-M) and high out-migration scenario (HO-M))

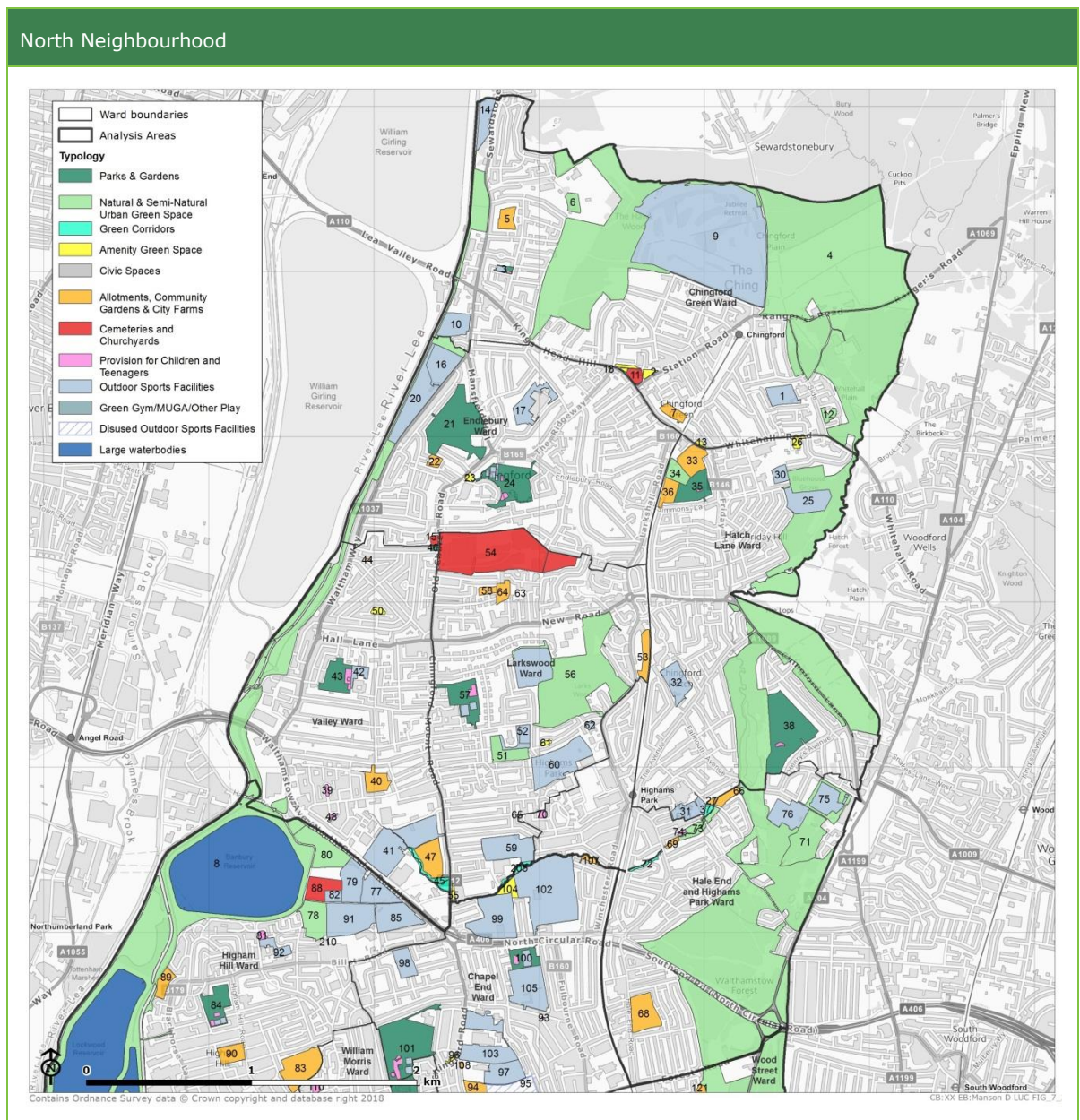
| Neighbourhood Area       | Public Open Space (ha) | 2017 population (rounded) | BPO scenario | 2035 population projection (rounded) | POS ha/1000 2017 | POS ha/1000 2035 |
|--------------------------|------------------------|---------------------------|--------------|--------------------------------------|------------------|------------------|
| Central Neighbourhood    | 183.7                  | 89,100                    | LO-M         | 104,800                              | 2.1              | 1.8              |
|                          |                        |                           | HO-M         | 104,100                              |                  | 1.8              |
| North Neighbourhood      | 349.6                  | 69,800                    | LO-M         | 77,300                               | 5.0              | 4.5              |
|                          |                        |                           | HO-M         | 77,000                               |                  | 4.5              |
| South East Neighbourhood | 71.9                   | 53,400                    | LO-M         | 62,900                               | 1.3              | 1.1              |
|                          |                        |                           | HO-M         | 62,500                               |                  | 1.2              |
| South West Neighbourhood | 82.0                   | 62,900                    | LO-M         | 96,300                               | 1.3              | 0.9              |
|                          |                        |                           | HO-M         | 95,600                               |                  | 0.9              |
| Total                    | 687.2                  | 275,200                   | LO-M         | 341,300                              | 2.5              | 2.0              |
|                          |                        |                           | HO-M         | 339,100                              |                  | 2.0              |

18.27 The Open Space Study notes that at borough level, current provision exceeds the proposed standard of 1.6ha/1000 people. There is, however, spatial variation across the borough with the Central and North Neighbourhood Areas exceeding the quantity standards and the South East and South West Neighbourhood Areas falling below the quantity standard.

18.28 It is unlikely that new open space will be able to be created to achieve a 1.6ha/1000 people standard in all neighbourhood areas, and it is also important to note that exceeding any quantity standard in the Northern Neighbourhood Area does not imply that open space in this part of the borough is surplus to requirement.

## Neighbourhood Profiles

Figure 18.12: Open Space Area Profile – Northern Neighbourhood



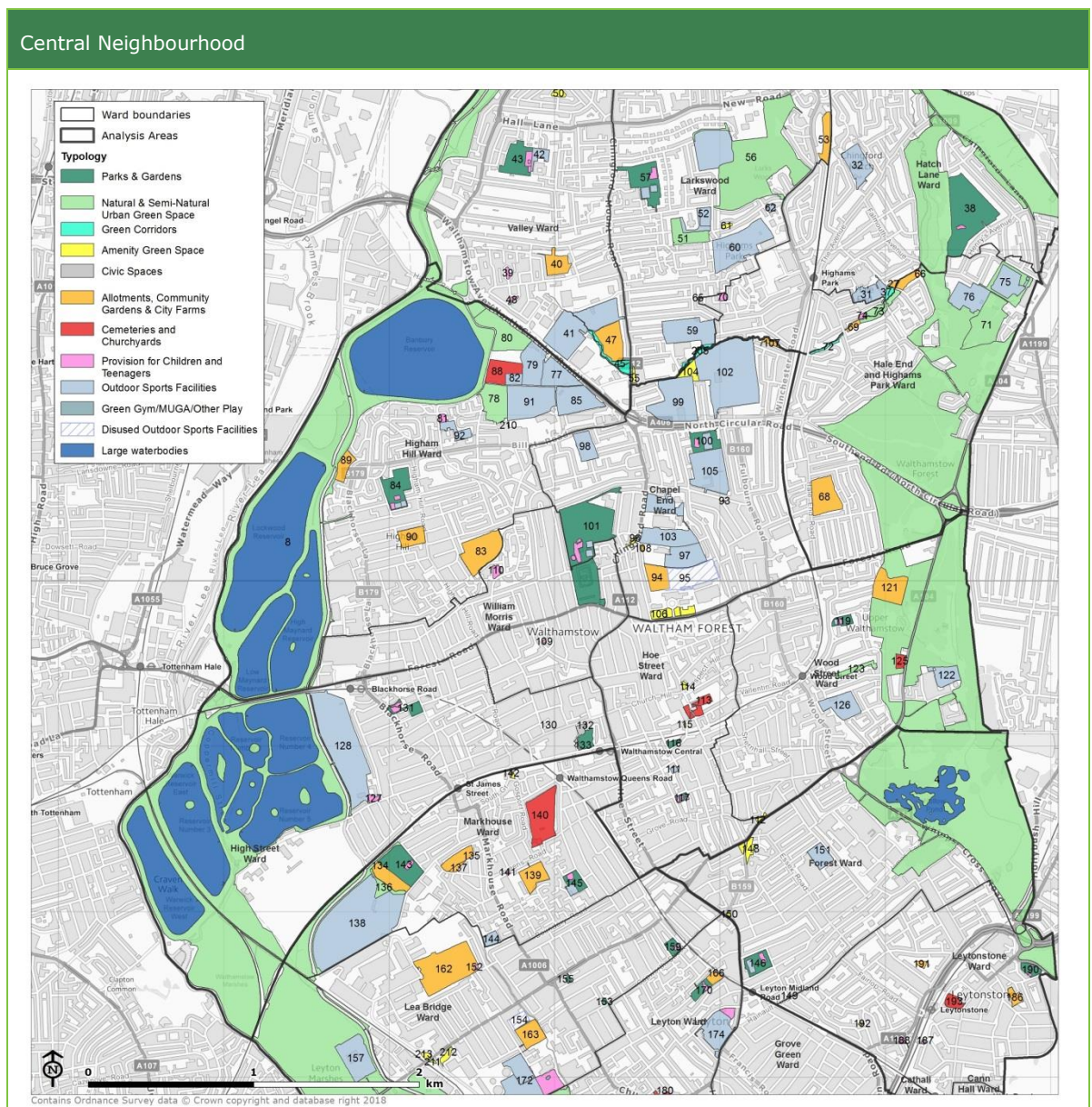
| Demographics   |                               |
|--|-------------------------------|
| 2017 population (rounded)                                  | 69,800                        |
| 2035 population projection (rounded)                       | 77,300 (11% increase on 2017) |
| Number of LSOAs in neighbourhood                           | 41                            |
| Number of LSOAs in 0-20% indices of multiple deprivation   | 9 (22%)                       |
| Number of LSOAs in 0-20% health and disability deprivation | 1 (2%)                        |
| Number of LSOAs in 0-20% living environment deprivation    | 1 (2%)                        |
| Number of LSOAs in 0-20% housing and services deprivation  | 27 (66%)                      |
| Quantity of public open space                              |                               |
| Public open space/ 1000 people 2017                        | 5.0ha                         |

|  |                   |
|--|-------------------|
| Public open space/ 1000 people 2035                      | 4.5ha             |
| Current provision against 1.6ha/1000 quantity standard   | +3.4ha            |
| Projected provision against 1.6ha/1000 quantity standard | +2.9ha            |
| Provision for children and young people/ child 2017      | 1.0m <sup>2</sup> |
| Provision for children and young people/ child 2033      | 1.0m <sup>2</sup> |
| Current provision across Waltham Forest/ child           | 1.2m <sup>2</sup> |
| Projected provision across Waltham Forest/ child         | 1.1m <sup>2</sup> |

#### Accessibility of open space

Although within the catchment area of a metropolitan natural and semi-natural green space, the Northern Neighbourhood falls outside the catchment area of district scale provision. This places pressure on the local and small local hierarchies of open space. There are sections of the neighbourhood's residents that fall outside the catchment areas of all publicly accessible open space. These tend to be located within the centre of the neighbourhood including the wards of Chingford Green, Larkswoods, Hatch Lane and small section of Hale End and Highams Park. Residents located in the north of Valley Ward are only within the catchment area of Amenity Green Space. There appears to be deficiency of play provision in areas to the north, central and south of the Neighbourhood.

Figure 18.13: Open Space Area Profile - Central Neighbourhood



| Demographics   |                                |
|--|--------------------------------|
| 2017 population (rounded)                                  | 89,100                         |
| 2035 population projection (rounded)                       | 104,800 (18% increase on 2017) |
| Number of LSOAs in neighbourhood                           | 44                             |
| Number of LSOAs in 0-20% indices of multiple deprivation   | 19 (43%)                       |
| Number of LSOAs in 0-20% health and disability deprivation | 2 (5%)                         |
| Number of LSOAs in 0-20% living environment deprivation    | 26 (59%)                       |
| Number of LSOAs in 0-20% housing and services deprivation  | 40 (91%)                       |
| Quantity of public open space                              |                                |
| Public open space/ 1000 people 2017                        | 2.1ha                          |
| Public open space/ 1000 people 2035                        | 1.8ha                          |
| Current provision against 1.6ha/1000 quantity standard     | +0.5ha                         |

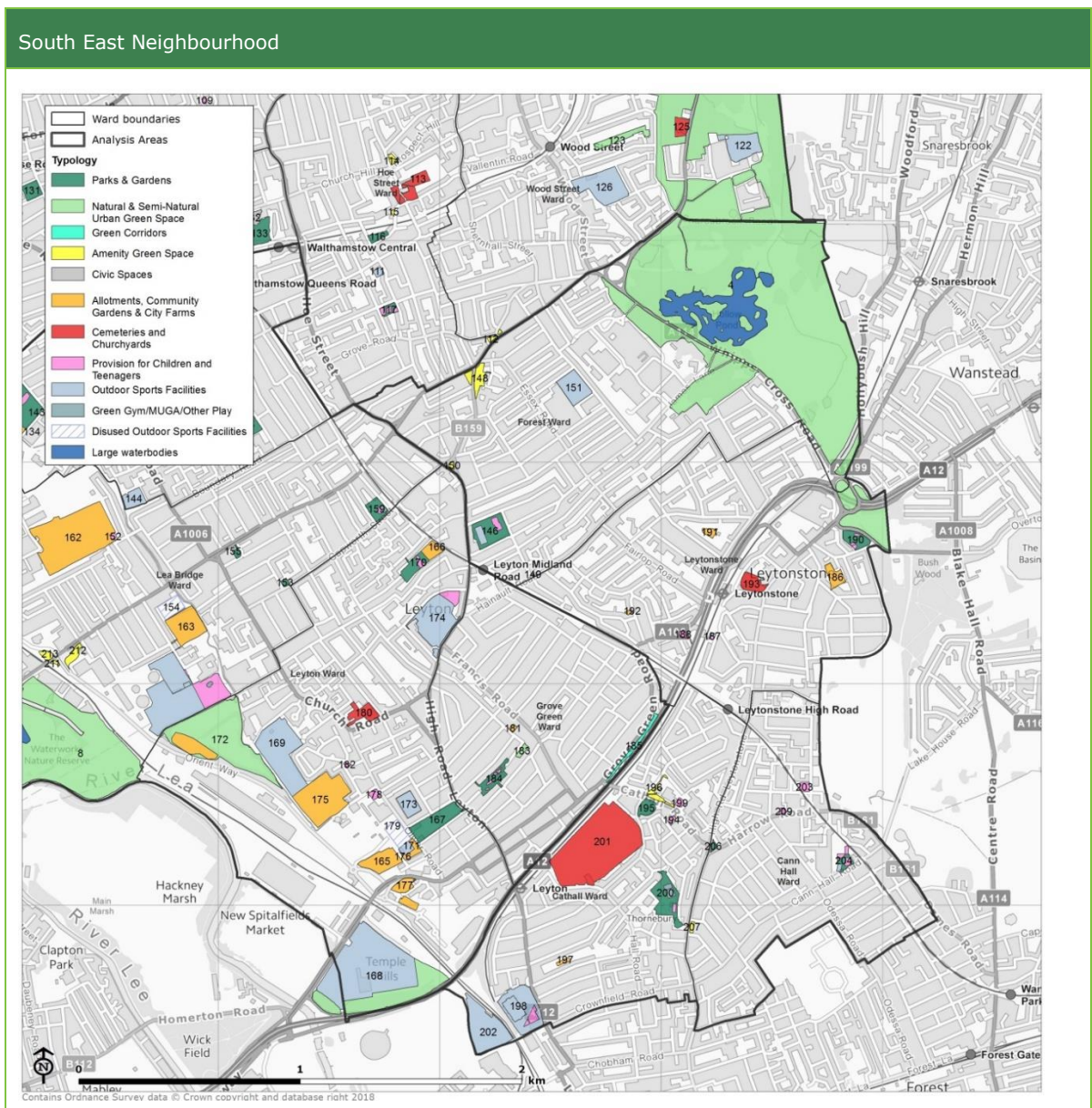


|  |                   |
|--|-------------------|
| Projected provision against 1.6ha/1000 quantity standard | +0.2ha            |
| Provision for children and young people/ child 2017      | 1.0m <sup>2</sup> |
| Provision for children and young people/ child 2035      | 1.0m <sup>2</sup> |
| Current provision across Waltham Forest/ child           | 1.2m <sup>2</sup> |
| Projected provision across Waltham Forest/ child         | 1.1m <sup>2</sup> |

Accessibility of open space

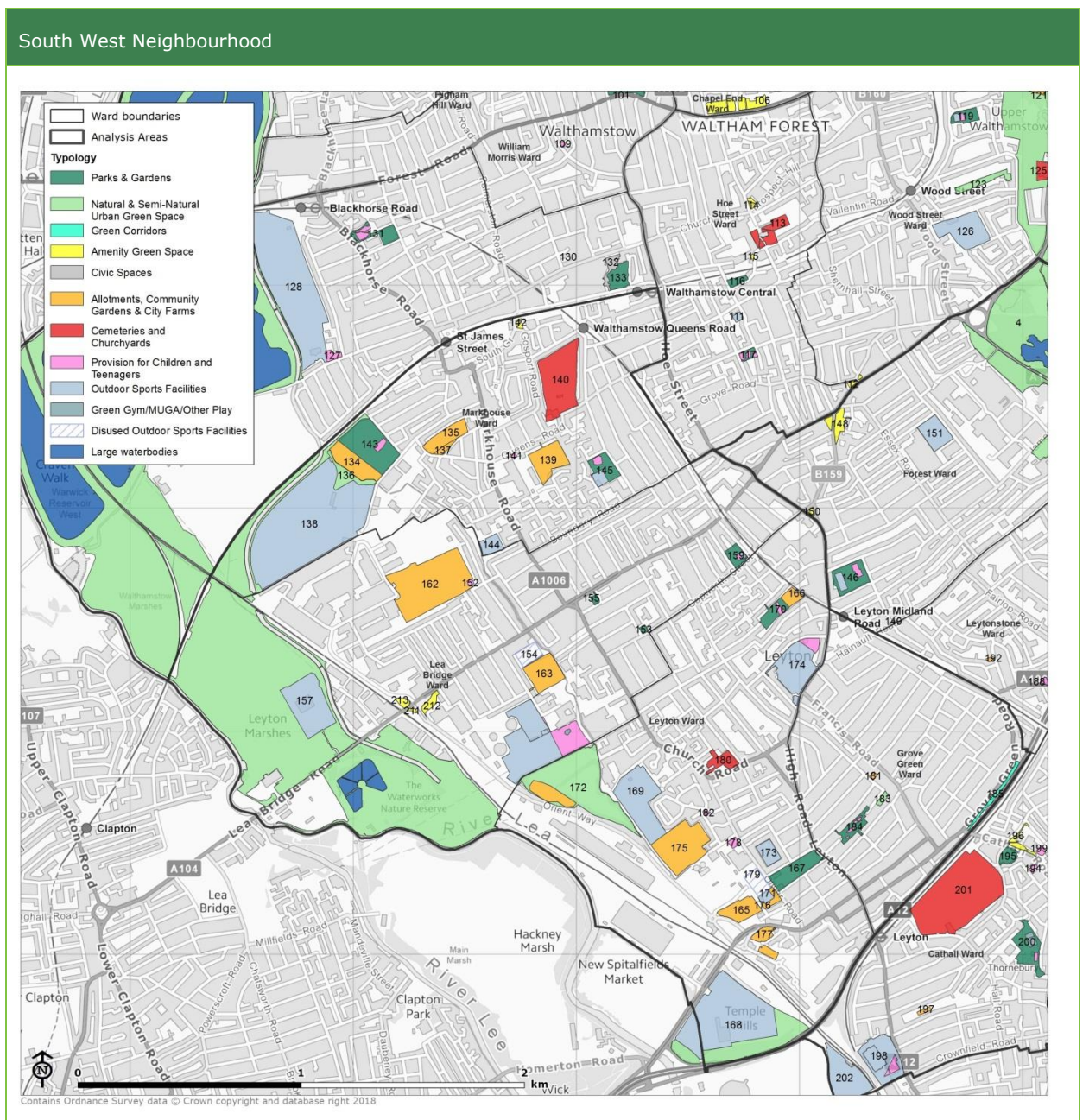
Large sections of the Neighbourhood fall outside the catchment area of local and small local publicly accessible open space. Areas also fall outside the catchment area of district scale provision. However, Lloyd and Aveling Park, a small park and garden, and Walthamstow Town Square Gardens, a small local park and garden cater for residents within the heart of the Central Neighbourhood area. This raises the importance of these open spaces. Eastern and western sections of the neighbourhood fall outside the catchment area of a play space.

Figure 18.14: Open Space Area Profile - South East Neighbourhood



| Demographics   |                               |
|--|-------------------------------|
| 2017 population (rounded)  | 53,400                        |
| 2035 population projection (rounded)   | 62,900 (18% increase on 2017) |
| Number of LSOAs in neighbourhood   | 29                            |
| Number of LSOAs in 0-20% indices of multiple deprivation   | 9 (31%)                       |
| Number of LSOAs in 0-20% health and disability deprivation   | 1 (3%)                        |
| Number of LSOAs in 0-20% living environment deprivation  | 20 (69%)                      |
| Number of LSOAs in 0-20% housing and services deprivation  | 27 (93%)                      |
| Quantity of public open space  |                               |
| Public open space/ 1000 people 2017  | 1.3ha                         |
| Public open space/ 1000 people 2035  | 1.1ha                         |
| Current provision against 1.6ha/1000 quantity standard   | -0.3ha                        |
| Projected provision against 1.6ha quantity standard:   | -0.5ha                        |
| Provision for children and young people/ child 2017  | 1.1m <sup>2</sup>             |
| Provision for children and young people/ child 2035  | 1.1m <sup>2</sup>             |
| Current provision across Waltham Forest/ child   | 1.2m <sup>2</sup>             |
| Projected provision across Waltham forest/ child   | 1.1m <sup>2</sup>             |
| Accessibility of open space  |                               |
| <p>There is no access to district level parks and gardens within the neighbourhood although Epping Forest provides opportunities for residents to access natural and semi-natural green spaces. There is no access to local parks and gardens within the South East Neighbourhood and limited access to small local parks and gardens. Access to small local parks and gardens is limited to the south of the neighbourhood and on the east and west boundaries. Leaving large areas of the central and northern areas with no access. The limited provision of parks and gardens places a greater reliance on the other open spaces within the neighbourhood. The very north east of the analysis area is deprived of access to both amenity green spaces and allotments.</p> |                               |

Figure 18.15: Open Space Area Profile - South West Neighbourhood



| Demographics   |                               |
|--|-------------------------------|
| 2017 population projection (rounded)                       | 62,900                        |
| 2035 population projection (rounded)                       | 96,300 (53% increase on 2017) |
| Number of LSOAs in neighbourhood                           | 30                            |
| Number of LSOAs in 0-20% indices of multiple deprivation   | 9 (30%)                       |
| Number of LSOAs in 0-20% health and disability deprivation | 1 (3%)                        |
| Number of LSOAs in 0-20% living environment deprivation    | 20 (67%)                      |
| Number of LSOAs in 0-20% housing and services deprivation  | 29 (97%)                      |
| Quantity of open space                                     |                               |
| Public open space/ 1000 people 2017                        | 1.3ha                         |
| Public open space/ 1000 people 2035                        | 0.9ha                         |

|  |                   |
|--|-------------------|
| Current provision against 1.6ha/1000 quantity standard   | -0.3ha            |
| Projected provision against 1.6ha/1000 quantity standard   | -0.7ha            |
| Provision for children and young people/ child 2017  | 1.7m <sup>2</sup> |
| Provision for children and young people/ child 2035  | 1.2m <sup>2</sup> |
| Current provision across Waltham Forest/ child   | 1.2m <sup>2</sup> |
| Projected provision across Waltham Forest/ child   | 1.1m <sup>2</sup> |
| Accessibility of public open space   |                   |
| The very south west of the south west neighbourhood has access to district level parks which are located outside of the borough boundary. The west and centre of the neighbourhood is within access to the district natural and semi-natural urban green space. The north east, centre and south of the neighbourhood is generally within accessible range of local and small parks and gardens. |                   |

### Proposals to Meet Growth to 2035

- 18.29 The projected population growth is likely to have a significant impact on open space provision in Waltham Forest. The provision of new open spaces in areas which experience the greatest levels of open space deficiency (i.e., the south of the borough) is going to be limited due to the dense urban environment which typically characterises these areas. In such instance's efforts should be made to ensure existing open spaces are multifunctional and are of a good quality and high value. Attempts should be made to also ensure all sectors of the community are able to easily access open spaces through the removal of physical barriers (e.g. providing safe crossing points across roads) and ensuring open spaces are appropriately promoted. In addition, innovative approaches to new open space provision will also be required.
- 18.30 Epping Forest and Lee Valley Regional Park provide access to natural and semi-natural urban green space for residents along the eastern and western edges of the borough (and visitors from beyond).
- 18.31 Where it is not possible to provide additional open space, consideration should be given to improving links between open spaces and providing green corridors to improve and enhance the network of green features. The open space network should be considered alongside the Public Rights of Way network, and opportunities should be sought to increase connectivity. Similarly, opportunities should be sought to improve the streetscape and public realm – looking for opportunities to green wide paths. In the case of open spaces separated by roads, consideration should be given to rerouting/removing roads.
- 18.32 With the high population density in the south of the borough, there will be limited opportunities for creating new open spaces. Continued access to surrounding open spaces including Queen Elizabeth Olympic Park needs to be safeguarded. Where links between Waltham Forest and open spaces in surrounding boroughs are not always as pleasant or easy, opportunities to improve connectivity should be sought.

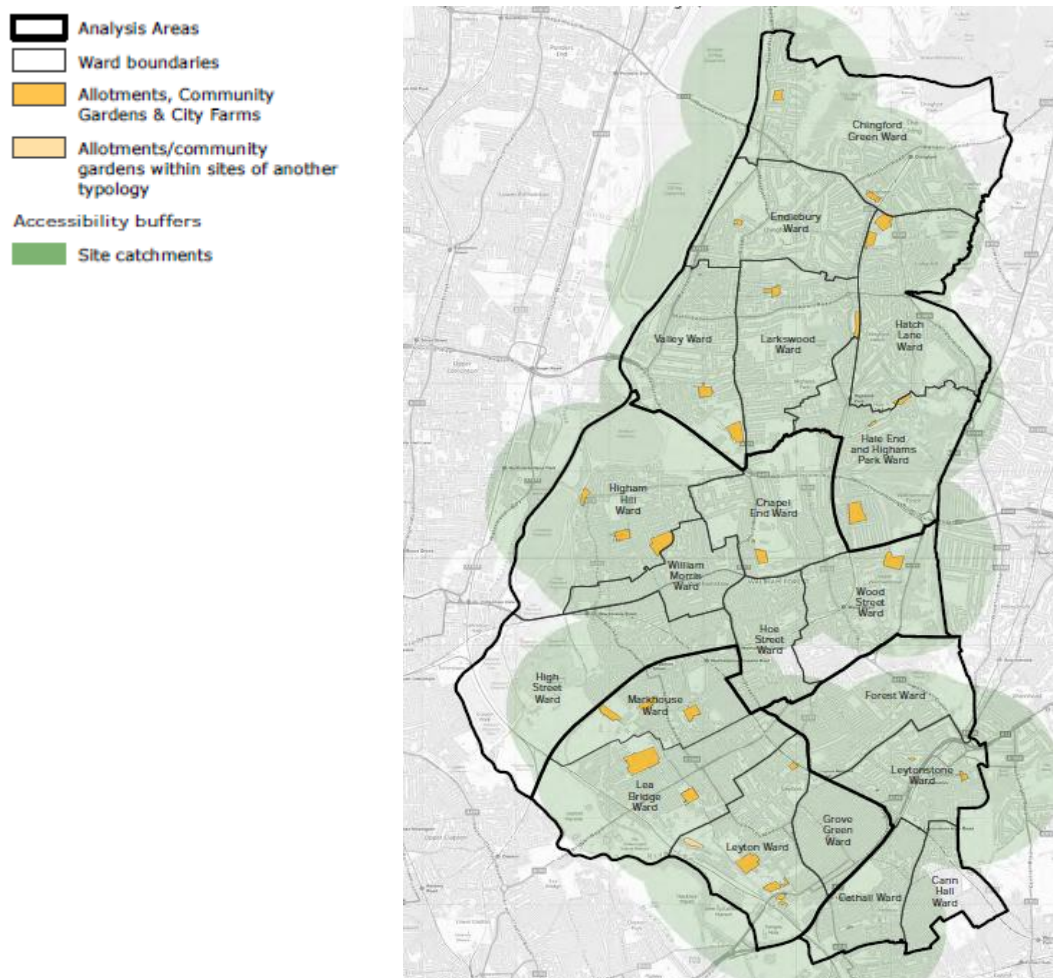
- 18.33 Where development is likely to increase pressure on the borough's green spaces, and opportunities for new provision are limited, the borough should look at innovative ways to provide green space at roof level or through green walls. Efforts should be made to ensure existing open spaces are multifunctional and are of a good quality and high value. Attempts should be made to also ensure all sectors of the community are able to easily access open spaces through the removal of physical barriers (e.g. providing safe crossing points across roads) and ensuring open spaces are appropriately promoted.
- 18.34 Where there is regeneration, new open space needs to be meaningful rather than 'leftover' open space. Opportunities should be sought to put development on the edge of spaces to enable larger blocks of open space to be created rather than smaller incidental open spaces amongst and around buildings. This will ensure that any spaces that are created as a result of development are more meaningful for existing and future residents of the borough.
- 18.35 Parks are increasingly becoming working spaces for a number of start-ups, social enterprises and home workers. It is likely that the needs of these community members are not yet fully understood.
- 18.36 Similarly, it is important to ensure that open spaces reflect their cultural value – both in terms of cultural heritage (war memorials) but also the cultural interests and traditions of surrounding communities.
- 18.37 The Draft London Plan commits to making London at least 50% green by 2050 and encourages boroughs to prepare green infrastructure strategies that integrate objectives relating to open space provision, biodiversity conservation, flood management, health and well-being, sport and recreation. For more information on Green (& Blue) Infrastructure in Waltham Forest, see the Waltham Forest Green and Blue Infrastructure Study 2020 [here](#).
- 18.38 The [Infrastructure Delivery Schedule](#) in Appendix 1 sets out a range of Parks and Open Spaces projects that will improve the resilience and capacity of our existing open spaces network.

# 19. Allotments

## Best Practice/Guidance

- 19.1 There is no current national standard for the quantity of allotment provision. The National Society of Allotment and Leisure Gardeners (NSALG) have suggested a national standard of 0.125 ha per 1000 population based on an average plot size of 250 square metres, however this is not referred to on the NSALG website.
- 19.2 In 2006 the University of Derby completed a study on behalf of the Office of the Deputy Prime Minister which indicated that the average provision of allotments was then 13 plots per 1000 households.
- 19.3 As can be seen in Figure 19.1 below, the majority of the borough's residents are within 1km of an allotment. Parts of Hoe Street, Forest and Wood Street wards are deficient in access to allotments.

Figure 19.1: Allotments and Accessibility in Waltham Forest (1000m)



## 20. Biodiversity & Trees

20.1 The borough has 27 Sites of Importance for Nature Conservation (SINCs) covering around 900 hectares. Over 80% of this area is designated Metropolitan Grade SINCs.

Figure 20.1: SINCs in Waltham Forest

| SINC grade        | No. of sites. |
|-------------------|---------------|
| Metropolitan      | 3             |
| Borough (grade 1) | 4             |
| Borough (grade 2) | 6             |
| Local             | 14            |

20.2 Large areas of ancient woodland run along the eastern boundary of the borough at Epping Forest. Blocks of ancient woodland are also seen in the centre of the borough at Larks Wood and Ainslie Wood, and to the north of the borough near Chingford Golf Course.

20.3 Much of Epping Forest is a designated SAC and SSSI.

20.4 The reservoirs in the south west of the borough within Lee Valley Regional Park are covered by international (Ramsar and Special Protection Area (SPA)), national (SSSI) and local (SINC) designations. Chingford Reservoirs designated SSSI site is located along the western borough boundary and covers King George's and William Girling Reservoirs.

20.5 Several UK priority habitats have been identified in Waltham Forest. This includes around 20 hectares of floodplain grazing marsh at Walthamstow Marsh, and around 160 hectares of wood pasture of Epping Forest within the borough boundary.

20.6 London Priority habitats identified in the borough include acid grassland, churchyards and cemeteries, parks and urban greenspaces, private gardens rivers and streams, standing water and woodland.

20.7 The combined length of rivers and streams in the borough is around 44 km.

20.8 There is around 1,200 hectares of publicly accessible open space in the borough which provide a range of habitat types of varying quality.

Figure 20.2: National and International Ecological Designations

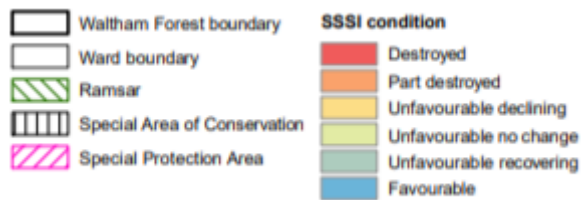
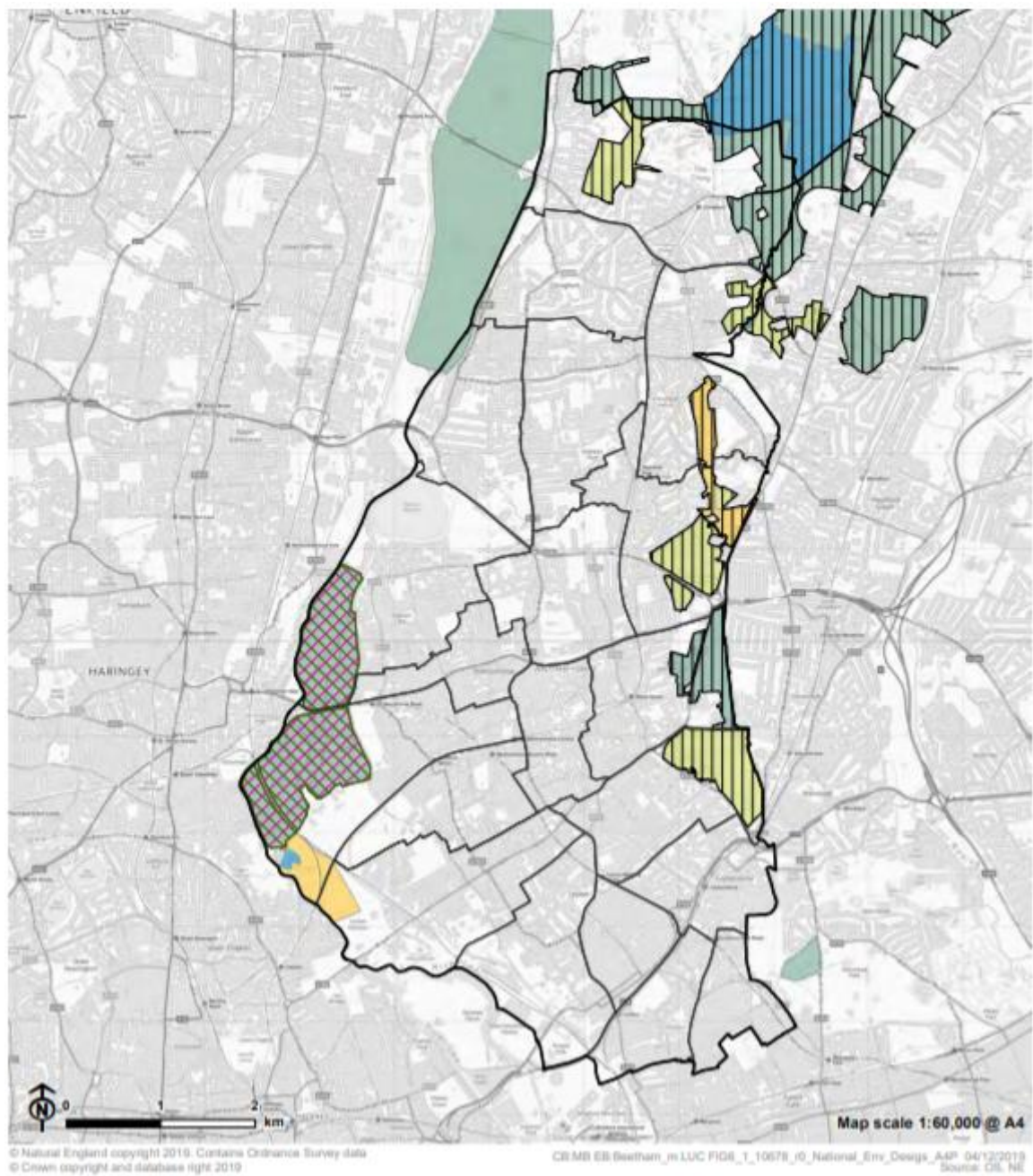
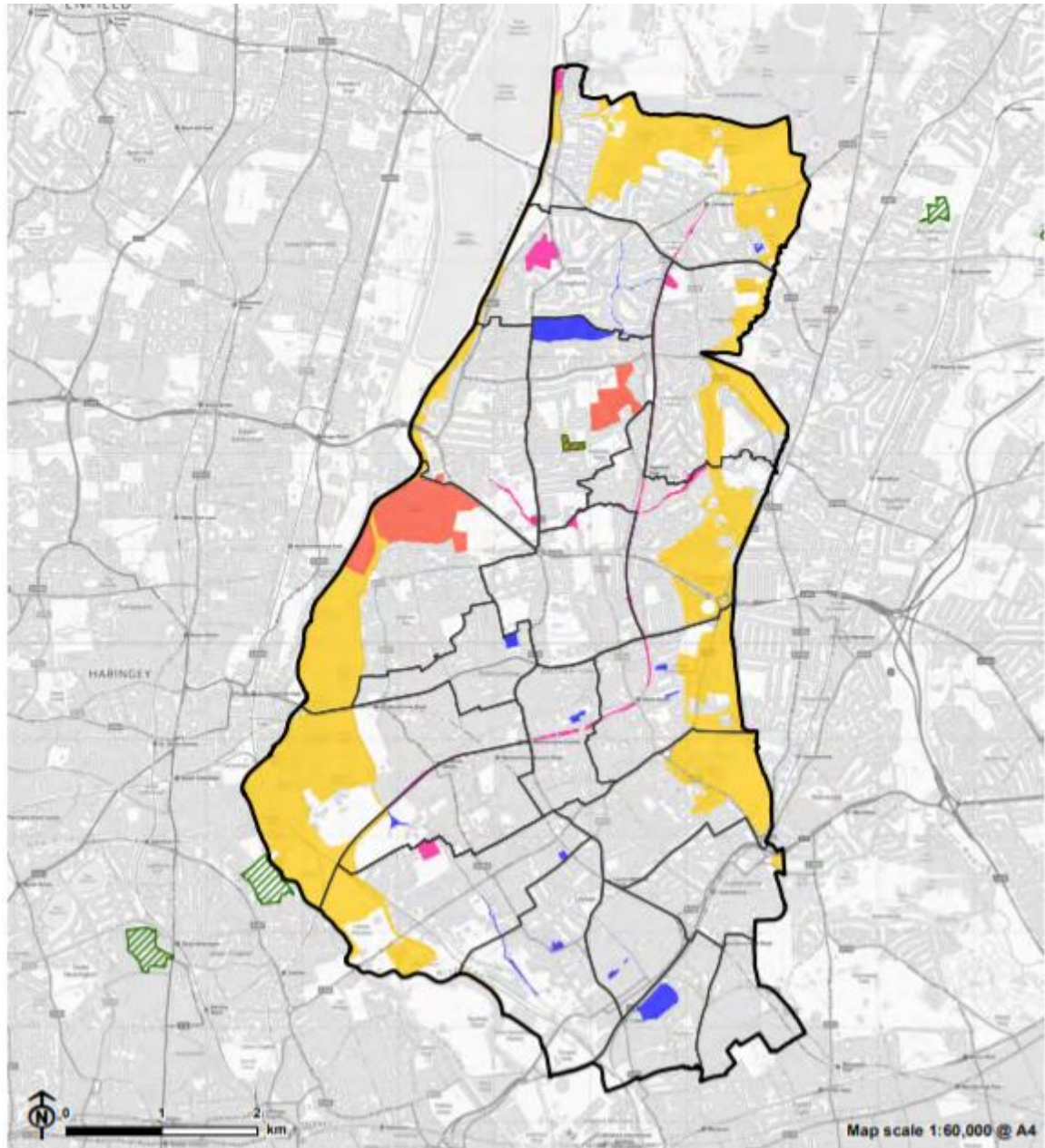


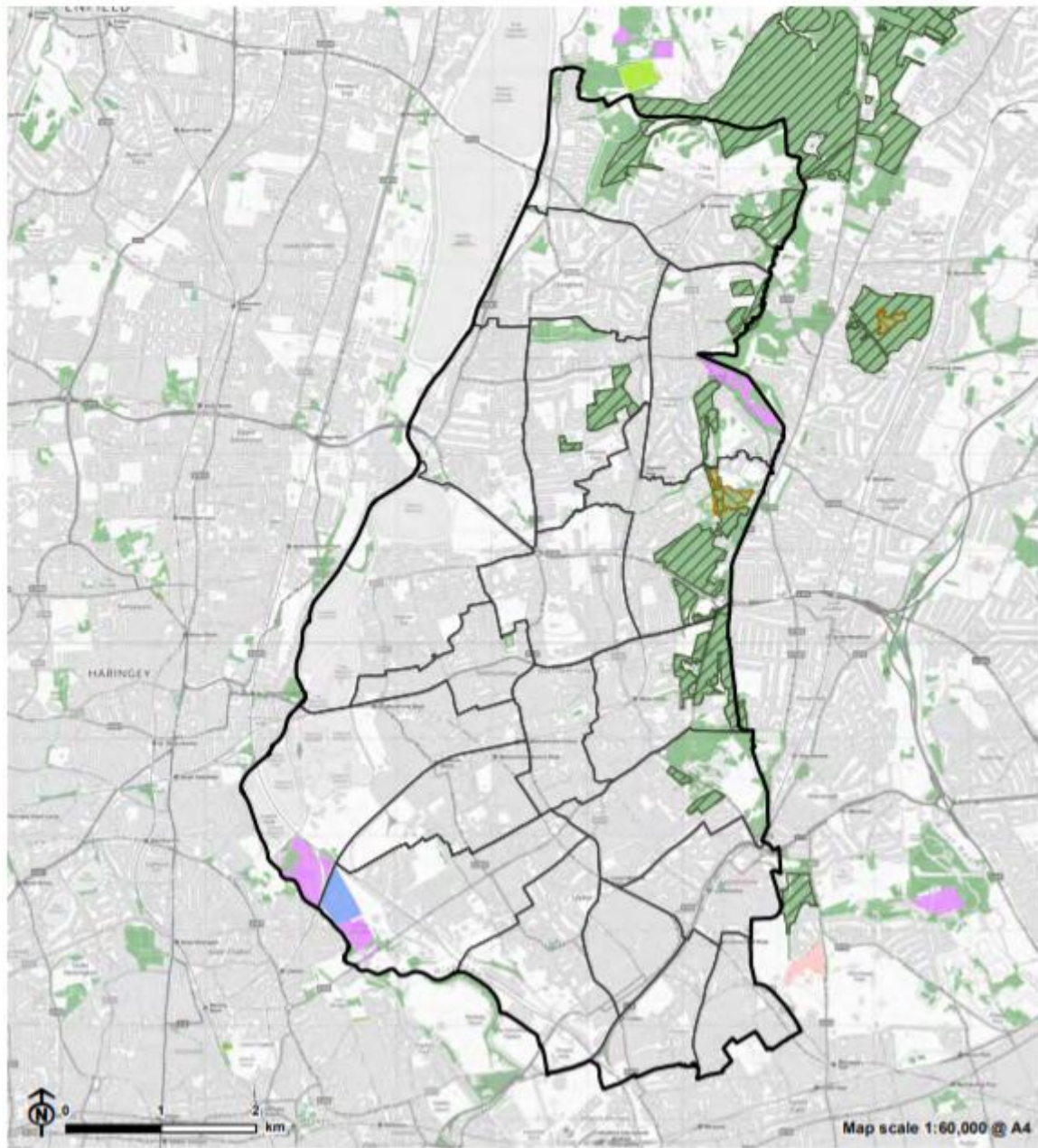


Figure 20.3: Regional and Local Ecological Designations



- |                         |   |
|-------------------------|---|
| Waltham Forest boundary | <b>Site of Importance to Nature Conservation*</b>         |
| Ward boundary           | Site of metropolitan importance to nature conservation    |
| Local Nature Reserve    | Site of grade 1 borough importance to nature conservation |
|                         | Site of grade 2 borough importance to nature conservation |
|                         | Site of local importance to nature conservation           |

Figure 20.4: Ancient Woodland and Priority Habitats



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- |   |  |
|---|--|
|  Waltham Forest boundary         | <b>Priority Habitat Inventory</b>  |
|  Ward boundary                   |  Coastal and floodplain grazing marsh |
| <b>Ancient Woodland</b>   |  Deciduous woodland                   |
|  Ancient & semi-natural woodland |  Good quality semi-improved grassland |
|  Ancient replanted woodland      |  Lowland dry acid grassland           |
|   |  Lowland meadows                      |
|   |  Traditional orchard                  |

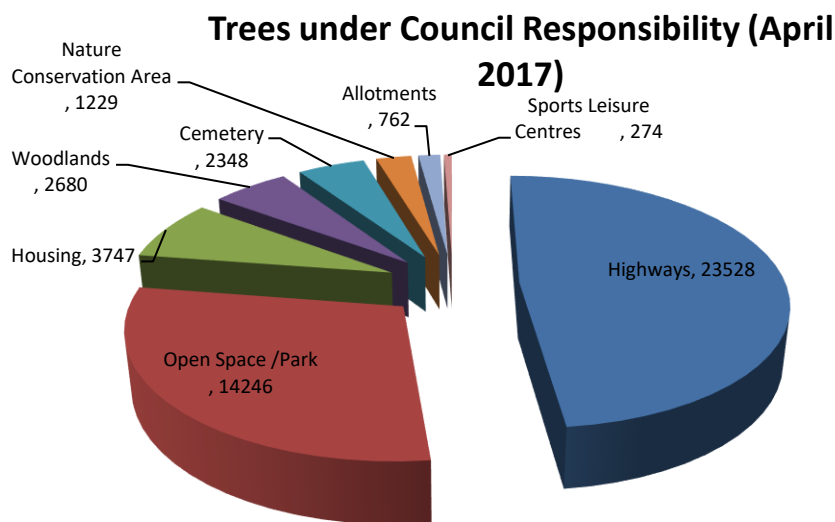
### **London Borough of Waltham Forest - Biodiversity Principles**

- The network of habitats of local, regional and international importance within Waltham Forest will be protected and enhanced through appropriate management, and the creation of additional habitat areas. Up to date habitat action plans and species action plans will provide a focus for identifying green and blue infrastructure priority projects in the borough.
- Planning policies and decisions within Waltham Forest will continue to be informed by guidance provided by Natural England relating to Epping Forest SAC and Lee Valley SPA. Appropriate measures will be taken to reduce air quality impacts where required. Opportunities will be sought to create alternative habitat areas on the site, increasing ecological resilience.
- Appropriate measures will be taken to reduce the impacts of urbanisation on European designated sites including reducing the risk of fires, mitigating the local effects of construction and reducing littering/ fly tipping.
- By undertaking further study and research, the council will deliver a borough-wide SANGs strategy which will mitigate recreational pressures on Epping Forest SAC and Lee Valley SPA/Ramsar site in the face of population growth and development. This will primarily consist of identifying improvements to existing green spaces to enhance their visitor capacity.
- Opportunities will be sought to work in partnership with neighbouring authorities, the City of London Corporation and Lee Valley Regional Park Authority to consider biodiversity and conservation at a landscape scale. This includes the potential to develop a strategic SANGs strategy.
- Measures will be taken to improve the stewardship of designated landscapes that are deemed to be in unfavourable condition.
- Areas of growth and development in the borough will help to secure improvements to the ecological value of the green and blue infrastructure network by creating links between existing habitat areas and additional habitat through appropriate site design, habitat creation, landscaping and other forms of urban greening. Improvements to existing habitat areas will be secured where necessary and will be focused on Priority Habitats and Species. The use of measurable standards will be used where needed to ensure biodiversity has been considered sufficiently.
- Development proposals will be required to consider linear habitat features and green corridors as part of site design and ensure these are strengthened through appropriate landscaping and habitat creation. The creation of multi-functional urban greening interventions, areas for recreation and Sustainable Urban Drainage Systems that provide biodiversity benefits will be promoted.
- Habitat creation and ecologically sensitive management within the borough's open spaces will continue to be promoted, supported and delivered through the Open Space Strategy and action plan.

## Trees

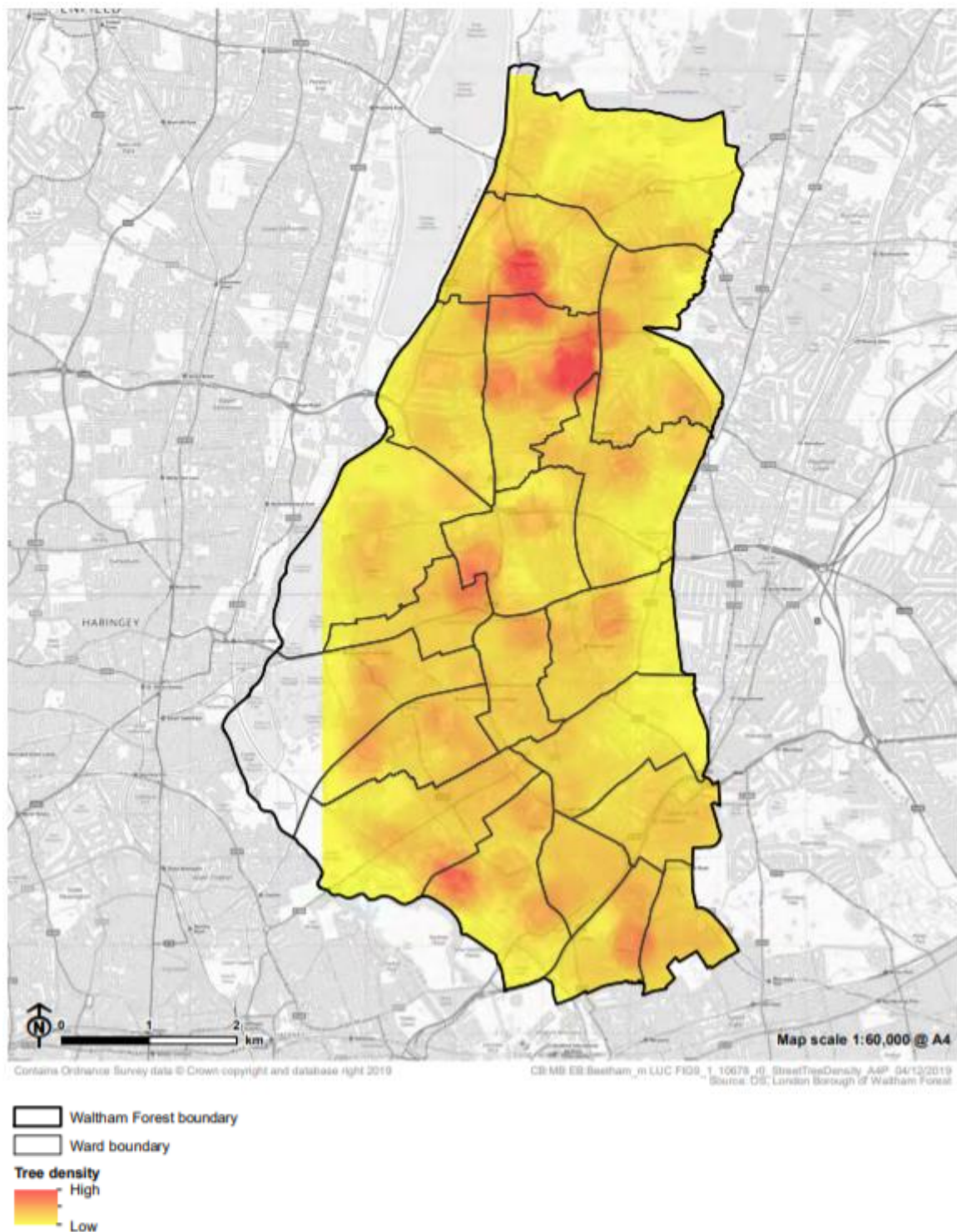
- 20.9 As of April 2017, there were 48,800 trees within Waltham Forest which fall under the responsibility of the Council, with the majority of these being street trees.
- 20.10 Between 2012 and 2017, the London Borough of Waltham Forest planted an additional 5,000 trees, increasing the total number in the borough by 12%. Furthermore, the following year saw 1,600 new trees being planted.
- 20.11 Tree stock predominantly contains native species, which potentially puts them at risk to a warming climate. The top ten species of tree (and no. of trees) owned and managed by the Council are as follows:
- Common Ash (2,187)
  - London Plane (2,172)
  - Common Lime (1,851)
  - English Oak (1,799)
  - Wild Cherry (1,724)
  - Sycamore (1,679)
  - Silver Birch (1,673)
  - Field Maple (1,548)
  - Hawthorn (1,465)
  - Blackthorn (1,369)

Figure 20.5: Location of trees under the Council's control



- 20.12 Approximately 1,863 individual trees, tree groups and trees in woodland are protected by Tree Preservation Orders within the borough, the majority of which are within residential gardens.

Figure 20.6: Street Tree Density in Waltham Forest



### Waltham Forest Council (2017) Waltham Forest Tree Strategy 2017-2022

20.13 The Waltham Forest Tree Strategy<sup>11</sup> sets a number of key aims and objectives relating to the future management and growth of the boroughs tree infrastructure. These are:

<sup>11</sup> <https://www.walthamforest.gov.uk/content/trees>

- To continue with a programme of planting in order to maintain tree canopy cover
- To carefully select trees to be planted - 'the right tree in the right place for the right reason'
- Cost effective management by taking a risk-based approach
- The council will fulfil its duty of care in respect to managing the risk posed by trees in publicly accessible areas such as woodlands, park and nature areas, through effective maintenance practices
- Raise awareness of tree maintenance issues among residents
- To improve air quality
- To ensure that trees are protected where this is appropriate
- Maximising Biodiversity
- Developing Dedicated Management plans
- Climate change and adaptation, including the role of tree

### **Green Roofs and Walls**

20.14 As of 2017 Waltham Forest had a total green roof area of 18,457m<sup>2</sup>, equating to 0.06m<sup>2</sup> of green roof per person. 22% of this total area are intensive green roofs, 78% extensive and 6% biosolar. This equates to a 135% increase between 2016 and 2017.

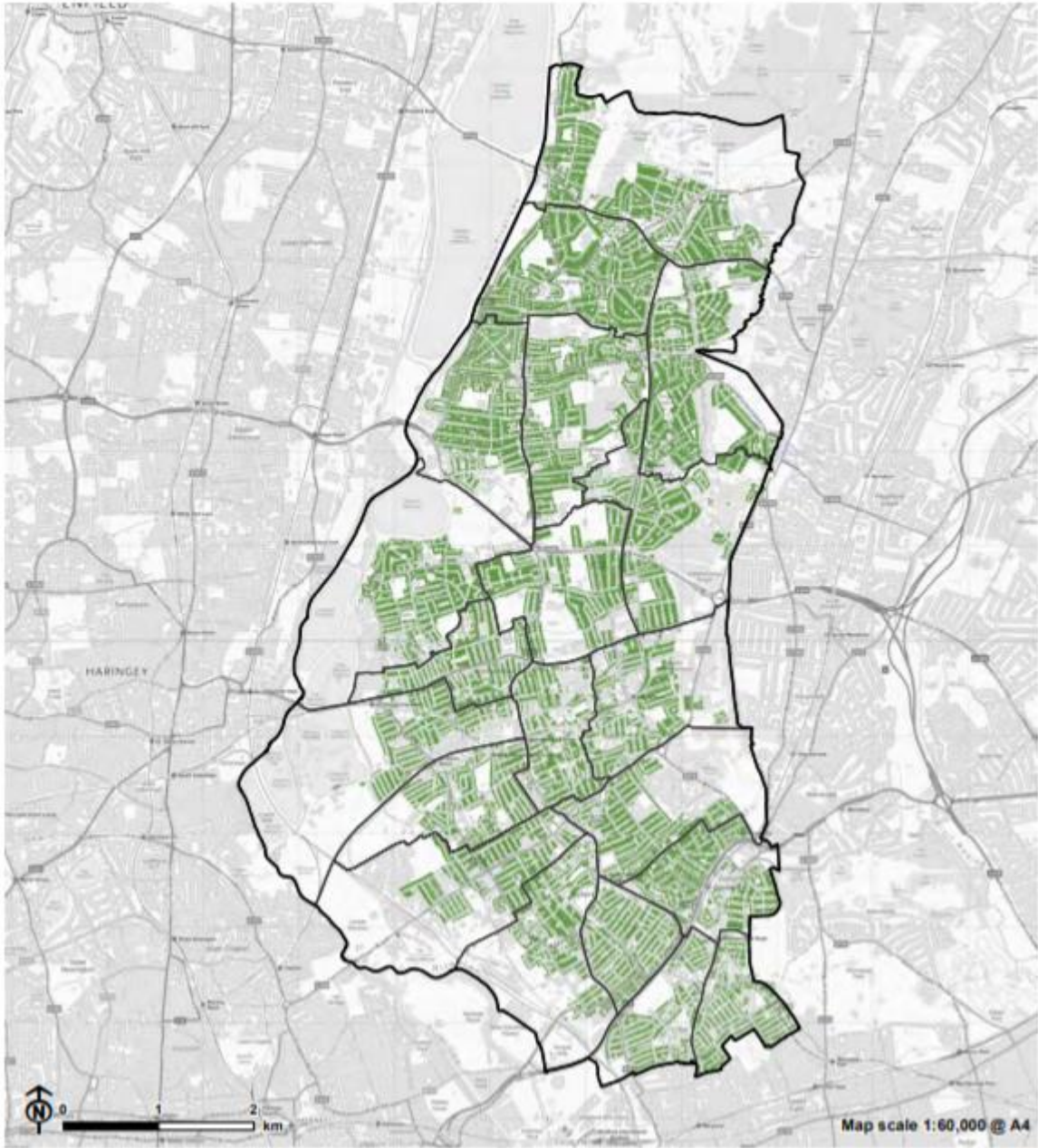
20.15 There have been several schemes in the borough installing green walls, including at the Mall, Walthamstow, and at Woodside Primary Academy.

### **The Role of Private Gardens**

20.16 Private gardens form an essential component of a resilient urban environment. Gardens can help to mitigate the severity of impacts on deficiencies in public open spaces, can positively contribute to biodiversity and help communities to respond to a changing climate. Consideration should be given to the impact of 'paving over' of front gardens, the impact this can have on a community's health and well-being, erosion of character and community cohesion.




20.17 The Draft Local Plan (Policy 58) acknowledges the role of private gardens and amenity space, protecting existing space where possible and delivering new amenity space as an integral part of new development.

Figure 20.7: Private Gardens in Waltham Forest



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CBMS EB Beetham\_inLUC FIGS 2 10075 00 PrivateGardens\_AAP 04/12/2019  
Source: OS, Linton Borough of Waltham Forest

-  Waltham Forest boundary
-  Ward boundary
-  Private garden

# 21. Air Quality

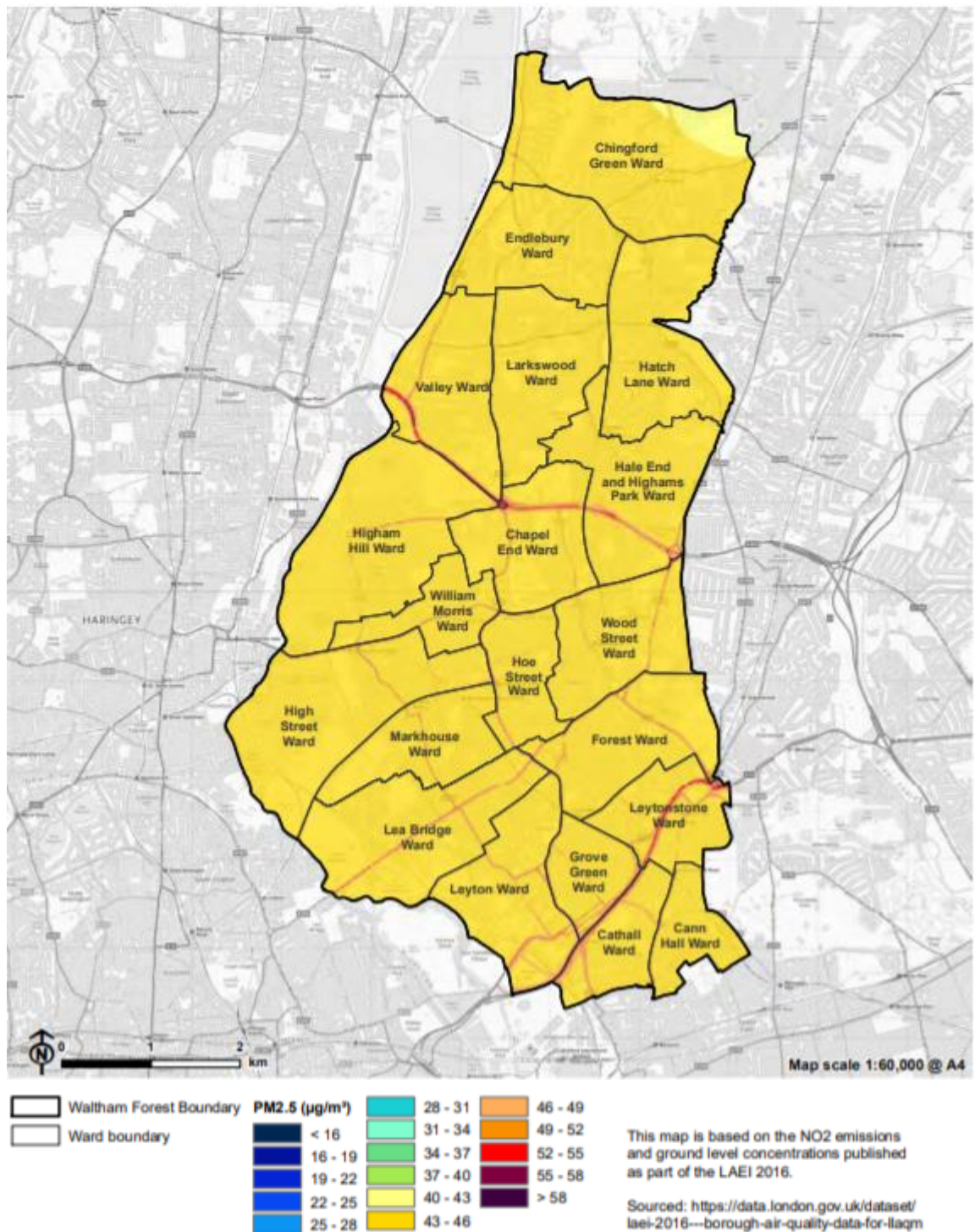
- 21.1 The whole of the borough is included within an Air Quality Management Area (AQMA). The AQMA area has primarily been declared in relation to the following:
- The borough is failing to meet the EU hourly and annual mean average limit values for NO<sub>2</sub> at roadside and kerbside locations.
  - The borough is meeting EU limits for PM<sub>10</sub> but failing to meet World Health Organisation air quality guidelines for this pollutant (no safe level has been identified).
  - The borough has formal responsibility to work towards reductions in PM<sub>2.5</sub> (a fraction of PM<sub>10</sub>).
- 21.2 Pollutants originate predominantly from road traffic. As such, the areas which display the highest concentrations of poor quality air are found along the busiest routes in Waltham Forest. The North Circular Road (A406), which cuts through the central portion of the borough from west to east, as well as the A12, which is located towards the south eastern corner of the borough, have the poorest air quality in the borough.
- 21.3 The southern portion of the borough is more developed and contains more A-roads than the north, and as a result, the southern part of the borough has larger areas of poor air quality. The north eastern corner of Waltham Forest (around Epping Forest) benefits from better air quality than the rest of the borough due to less dense road infrastructure and the presence of Epping Forest. This disparity in air quality across the borough can be seen in Figure 21.1.

## Air Quality Monitoring Infrastructure

- 21.4 The London Borough of Waltham Forest has been monitoring air quality across the borough since 1993.
- 21.5 We currently have three automatic monitoring sites:
- Dawlish Road urban background
  - Crooked Billet kerbside
  - Ruckholt Close roadside
- 21.6 All three sites monitor for PM<sub>10</sub> and NO<sub>2</sub>. Data from all three sites is listed online for the public to freely access. Data collected from 1998 to March 2011 is listed in the London Air Quality Network (LAQN). Data collected from April 2011 onwards is listed in the Air Quality England (AQE) website.
- 21.7 In addition to the automatic monitoring sites, Waltham Forest also has 49 NO<sub>2</sub> diffusion tube sites. The location of the Boroughs monitoring infrastructure can be viewed [here](#).



Figure 21.1: Annual mean PM2.5 concentrations from LAEI 2016



21.8 The data from these monitoring sites has been used to model excrescences in the EU limit for annual NO<sub>2</sub>, specifically for relevant exposure. These studies have shown that the number of households exposed to more than the EU recommended maximum amount of Nitrogen Dioxide has dropped dramatically, from 58,000 in 2007 to just 6,300 in 2017. The full reports can be viewed below:

- [Detailed modelling of nitrogen dioxide in the London Borough of Waltham Forest](#) (4.1MB PDF file)
- [Addendum to Waltham Forest detailed modelling](#) (6.4MB PDF file)

- [Population exposure comparison 2007 and 2017](#) (1.9MB PDF file)

21.9 A copy of the Council's Air Quality Annual Status Report for 2019 is available [here](#).

### **Air Quality Focus Areas**

21.10 There are 13 Air Quality Focus Areas that have been identified as having high levels of pollution and human exposure:

- Sewardstone Rd & Kings Head Hill
- Hall Lane & North Circular
- Forest Rd, Blackhorse Rd, Blackhorse Lane
- Lea Bridge Rd
- Lea Bridge Rd & Markhouse Rd
- Hoe St & Selbourne Rd
- Leyton High Rd, Warren Rd, Ruckholt Rd
- Billet Round About, Chingford Rd, Billet Rd
- Southend Rd, Woodford New Rd
- Forest Rd & Wood St
- Whipps Cross Rd & Lea Bridge Rd
- Hoe St
- Green Man Round About, Leytonstone High Rd, Gainsborough Rd

### **London Borough of Waltham Forest Air Quality Action Plan 2018-2023**

21.11 The Council's AQMP 2018-2026<sup>12</sup> has developed actions that can be considered under six broad topics: Emissions from developments and buildings:

- 1) Emissions from buildings account for about 15% of the NOX emissions across London so are important in affecting NO2 concentrations;
- 2) Public health and awareness raising: increasing awareness can drive behavioural change to lower emissions as well as to reduce exposure to air pollution;
- 3) Delivery servicing and freight: vehicles delivering goods and services are usually light and heavy-duty diesel-fuelled vehicles with high primary NO2 emissions;
- 4) Borough fleet actions: our fleet includes light and heavy-duty diesel-fuelled vehicles such as mini buses and refuse collection vehicles with high primary NO2 emissions. Tackling our own fleet means we will be leading by example;
- 5) Localised solutions: these seek to improve the environment of neighbourhoods through a combination of measures; and
- 6) Cleaner transport: road transport is the main source of air pollution in London. We need to incentivise a change to walking, cycling and ultra-low emission vehicles (such as electric) as far as possible.

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<sup>12</sup> <https://democracy.walthamforest.gov.uk/documents/s61432/FINAL%20Appendix%201%20Air%20Quality%20Action%20Plan%202018-2023.pdf>

- 21.12 The Council's air quality priorities are to manage the impact of future growth in the borough, support healthier lifestyles for residents, reduce the impact of traffic on air quality and congestion as well as reducing our own impact on air quality.
- 21.13 In 2018 Waltham Forest Council commissioned King's College London's Environmental Research Group to model the impacts of recent road interventions in the borough, particularly the Enjoy Waltham Forest scheme, on air quality.
- 21.14 The report found that measures to prioritise pedestrians and cyclists such as segregated cycle lanes, increased pocket parks and timed road closures had made a marked contribution to improving air quality and health in the borough

### **Example Air Quality Initiatives in Waltham Forest**

#### **Green screens**

- 21.15 Green screens have been provided at eight schools in the borough that have playgrounds next to busy roads. The screens provide a barrier between children playing in playgrounds and pollution caused by road traffic, with the plants helping absorb some of the pollution.

#### **Anti-idling events**

- 21.16 Idling vehicles cause unnecessary pollution. The Council has worked with schools across the borough to encourage parents to switch off when dropping off or picking up children before and after school. This project has been combined with other initiatives to encourage walking and cycling to school.

#### **School Streets**

- 21.17 The London Boroughs of Waltham Forest and Haringey have worked with Groundwork London to engage with nine schools to deliver an air pollution education programme<sup>13</sup>. The project engaged 5 primary schools in the London Borough of Haringey and 4 primary schools in the borough of Waltham Forest.
- 21.18 This project involved delivering a number of science-based air pollution lessons looking at local air pollution levels via GIS and an investigation activity into the particulate levels at participating schools. This was followed by a creative workshop chosen by the school (ranging from travel related workshops, solar oven building, or arts and crafts based creative exploration of the air quality theme). Schools also had the opportunity to receive an interactive 'fun' animation session about air pollution using the school's individual messages they wanted to portray, as well as the option to go on a field trip on the topic of sustainable cities. This project was to raise awareness of the risks that are associated with air pollution and the actions that can be taken to improve air quality.

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<sup>13</sup> <http://static.walthamforest.gov.uk/sp/documents/FB-140221-Haringey-and-Waltham-Forest-final-evaluation.pdf>

21.19 This project is now being developed to restrict traffic entering roads near schools around the morning and afternoon start and end times for schools, to reduce pollution levels and increase safety for school children and their parents.

### **City Trees**

21.20 Waltham Forest Council has achieved a London first and permanently installed two City Trees in Leytonstone. City Tree is a free-standing outdoor air cleaning system that uses the power of biotechnology to emulate the pollution-reduction benefits of 275 urban trees.



Figure 21.2: One of the First ever City Trees delivered in London, Leytonstone 2019

21.21 The City Trees, or moss trees, are the world's first biotech pollution filter and use living plants to filter pollutants from air, creating microenvironments of cleaner air that benefit residents and passers-by.

21.22 The Council's financial contribution towards the initiative was secured through developer contributions (Section.106).

### **Climate Change Emergency**

21.23 The Council declared a climate emergency in April 2019, at a Full Council meeting<sup>14</sup>, and committed to launching a Climate Emergency Commission – the first in London - to help shape their local response to this global challenge and to produce a set of policy 'asks' for regional and national politicians.

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<sup>14</sup> <https://democracy.walthamforest.gov.uk/mgAi.aspx?ID=32233>

- 21.24 The Commission comprises of experts from across the energy, waste and environmental sectors to bring their knowledge and expertise to help the Council in the next phase of tackling the climate emergency.
- 21.25 The Commission will inform the Council's Climate Emergency Strategy and make recommendations for how, as a borough, the Council can work together with residents, businesses and partners to tackle a global issue in a local context.
- 21.26 Projects arising from the Councils AQAP are captured in the [Infrastructure Delivery Schedule](#) in Appendix 1.
- 21.27 You can find out more about the Waltham Forest Climate Emergency [here](#).

# 22. Blue Infrastructure & Strategic Flood Risk Assessment

## Introduction

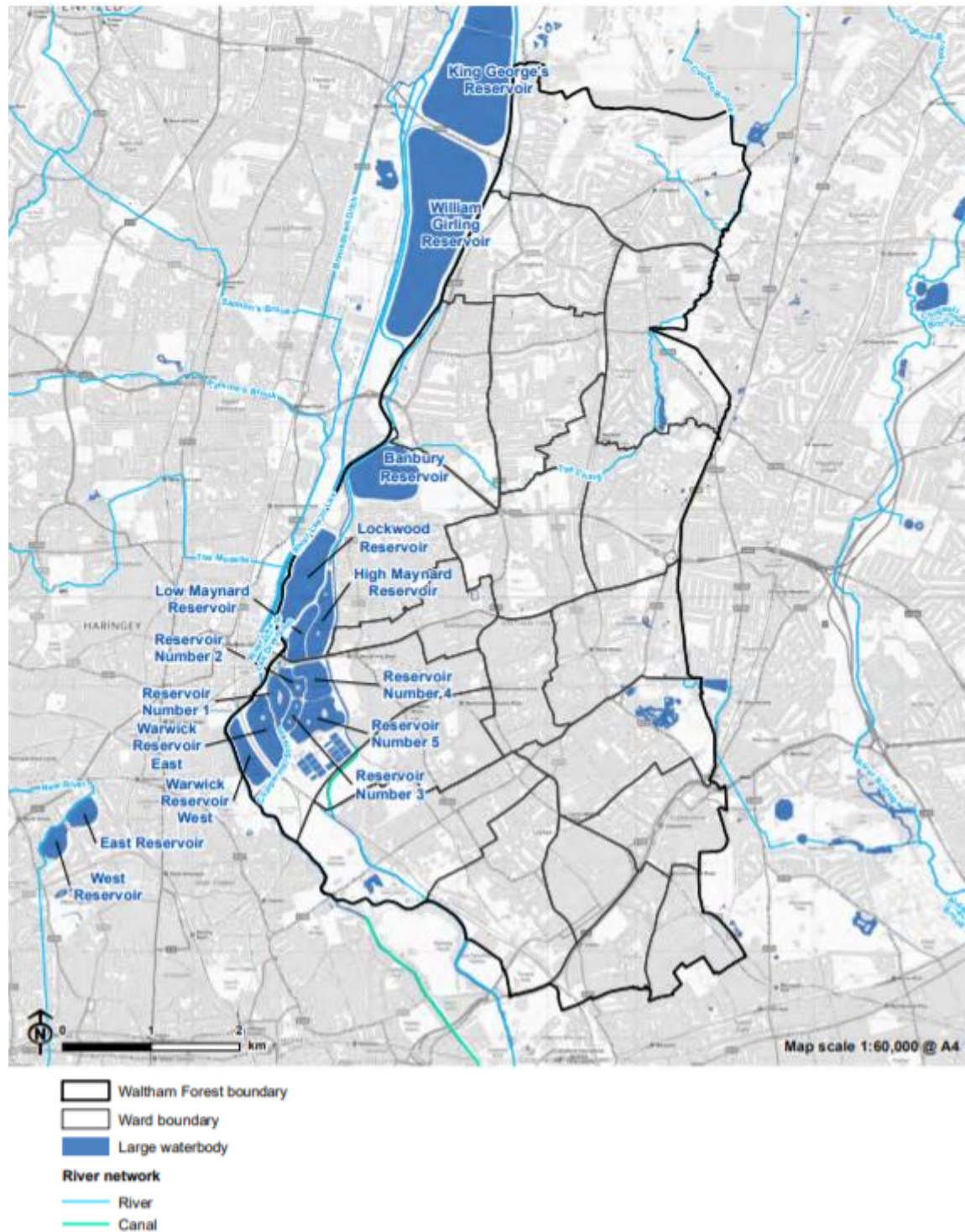
- 22.1 Blue infrastructure plays a fundamental role in managing flooding, as well as enhancing biodiversity and enjoyment of public open space. With climate change contributing to an increased frequency and magnitude of extreme weather events, and therefore heightening the risk of localised fluvial and surface flooding, the need for a functional relationship between green and blue infrastructure has never been greater.
- 22.2 Blue corridors can host a variety of habitats and species of local and national importance. This is particularly important in large metropolitan areas like London, where urbanisation and development can result in fragmentation of habitats and put pressure on wildlife.
- 22.3 The River Lea flows along the western boundary of Waltham Forest, through Lee Valley Regional Park, and is the borough's primary source of blue infrastructure. Running along the same corridor is the Lee Navigation, a canalised river, which together act as the main source of flood risk within the borough. Most of the discharge from the River Lea is diverted into the Lee Navigation to maintain water levels through a series of locks<sup>15</sup>.
- 22.4 The River Lee Flood Relief Channel is located to the east of the River Lea, in the lower reaches of the Lea Valley. It plays a vital role in reducing the flood risk within the densely populated neighbouring areas and since its construction in 1976 there have been no major floods within the borough<sup>16</sup>. The 18m wide and 3m deep channel is lined with concrete and for much of the year hold very little water. This is due to the channel only receiving water when the Lee Navigation is at capacity.
- 22.5 The Dagenham Brook and the River Ching are both tributaries of the River Lea, and as they flow through urban areas, are often culverted.
- 22.6 The Dagenham Brook is a heavily urbanised watercourse flowing from the River Lee Flood Relief Channel before merging with the River Lea and then re-joining the Lee Navigation. Spillways allow the brook to discharge water into the Relief Channel during periods of heavy rainfall as the channel is primarily fed by surface water.
- 22.7 The River Ching, or Ching Brook, flows south along the eastern boundary of Waltham Forest before crossing the borough and merging with the River Lea around the Banbury Reservoir. The channel runs culverted beneath roads and railways within Waltham Forest, including the North Circular Road (A406).

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<sup>15</sup> Waltham Forest Council (2011) Level 2 Strategic Flood Risk Assessment

<sup>16</sup> Waltham Forest Council (2014) Local Flood Risk Management Strategy

Figure 22.1: Blue infrastructure assets in Waltham Forest



22.8 The River Lea is no longer tidal; however, its lower reaches have a tidal influence from the River Thames due to the flood defences at Three Mills Locks during high tides.

22.9 Sitting alongside the River Lea are a series of reservoirs. Further upstream, within the borough of Enfield, two major reservoirs feed the River Lea network, the William Girling Reservoir and the King George's Reservoir.

- 22.10 Within Waltham Forest itself there are seven reservoirs which exceed the Environment Agency's categorisation of 25,000m<sup>3</sup> of water, and therefore are subject to regulation under the Reservoir Act 1975. These include the Banbury, Lockwood, High Maynard, East Warwick, West Warwick, Walthamstow No. 4 and Walthamstow No. 5 reservoirs. Additional smaller reservoirs are also located here, and collectively make up the Walthamstow Reservoirs, providing drinking water for 3.5 million people.
- 22.11 All reservoirs within Waltham Forest are classified as 'non-impounding', meaning earth embankments form all sides of the body of water.
- 22.12 The complex of reservoirs, excluding Banbury Reservoir, is designated as a SSSI, although it is currently deemed to be in an 'unfavourable but recovering' condition.
- 22.13 The Walthamstow Reservoirs and their immediate surroundings now make up the Walthamstow Wetlands, a nature reserve opened to the public in October 2017. As well as providing an important habitat for wildlife, including rare waterfowl and birds of prey, the reserve hosts a range of recreational opportunities including cycling, walking, fishing, birdwatching, public art, a visitor centre and a café.
- 22.14 The opening of the reserve was made possible through a partnership between Thames Water, the landowner, London Borough of Waltham Forest, the grant holder, and London Wildlife Trust, the conservation delivery partner.
- 22.15 The Coppermill Stream in the Lea Valley and numerous unnamed ditches make up a network of ordinary watercourses which traverse the borough.

#### **Preventing Flood Risk in Waltham Forest**

- 22.16 The concentration of Waltham Forest's blue infrastructure being in the Lea Valley means fluvial flood risk is generally focussed in the west of the borough, with the exception of the River Ching Corridor.
- 22.17 Managing flooding from the main rivers and reservoirs mentioned within the Key Assets section falls under the responsibility of the Environment Agency.
- 22.18 The River Lee Flood Relief Channel is currently thought to withstand a 1 in 50-year flooding event. However, this is likely to reduce over time due to the increasing risks of climate change and urbanisation coupled with infrastructure deterioration.
- 22.19 The management of ordinary watercourses within the borough is the Council's responsibility as the Lead Local Flood Authority. This includes the clearing of ditches at Overton Road, Chingford Lane, Rangers Road, Oak Hill, Brookfield Path and Leyton Common Sewer. There are currently no records of flooding from ordinary watercourses



in Waltham Forest<sup>17</sup>, although this is not to say there is no future flood risk from this source.

- 22.20 More localised forms of flooding, mainly due to surface water accumulation when drainage networks cannot cope during heavy rainfall, can be found throughout the borough.
- 22.21 There are 13 Critical Drainage Areas in Waltham Forest, which are at a more significant risk to flooding from surface water. Analysis of these results shows that 26,400 residential properties and 3,600 non-residential properties could be at risk of surface water flooding of a depth greater than 30mm during a rainfall event with a 100-year return period.

### **Water Quality**

- 22.22 The Lea Catchment is one of the most polluted in the country, with the Lea once being described as the UK's most polluted river<sup>18</sup>. A study done in 2012 found that the river network was being devastated by pollution<sup>19</sup>.
- 22.23 In particular, the Dagenham Brook in Waltham Forest had extremely high levels of phosphates, indicating chemicals from people's homes and sewage was entering the watercourse. It was also noted that the River Ching could be healthy, however it is spoiled by chemicals and raw sewage.
- 22.24 Following a series of river cleans by Thames21 and the Marine Conservation Society, it was found that 78% of litter was single use, with food wrappers, plastic bottles and plastic bags being the most commonly found items in the Thames' tributaries<sup>20</sup>.
- 22.25 Community water quality monitoring has been introduced in the Lower River Lea. This has equipped members of the local community with the skills needed to identify, analyse, investigate and test scenarios of implementing green and blue infrastructure solutions which improve the health of their rivers<sup>21</sup>.
- 22.26 In light of this analysis, Thames21 has recently re-wilded sections of the River Lea as it runs through Waltham Forest in a bid to improve the health of the watercourse using floating reedbeds. This not only provides valuable habitats but will help to improve the water quality.

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<sup>17</sup> Waltham Forest Council (working draft) Surface Water Management Plan <http://www.queenelizabetholympicpark.co.uk/-/media/lldc/local-plan/local-plan-examination-documents/borough-evidence-base-documents/beb16-walthamforest-swmp.ashx?la=en>

<sup>18</sup> Thames21 (2018) <https://www.thames21.org.uk/2018/09/thames21-rewildsone-of-uks-most-polluted-waterways/>

<sup>19</sup> Thames21 (2012) <https://www.thames21.org.uk/2012/04/snapshot-of-eastlondons-rivers-shows-they-are-choked-with-our-chemicals-and-sewage/>

<sup>20</sup> Thames21 (2019) <https://www.thames21.org.uk/2019/02/the-thames-pollutedby-single-use-items/>

<sup>21</sup> Thames21 (2018) <https://www.thamesriverstrust.org.uk/thames-21community-water-quality-modelling-lower-river-lea/>

- 22.27 Furthermore, Thames21 has carried out research into the relationship between river quality and road runoff across London, finding a clear link between the two. By mapping the surface water sewers which drain the roads and seeing where they intersect with green spaces, a shortlist of potential sites for constructed wetland interventions was created. Several of these potential sites have been identified across the borough.
- 22.28 Areas along the River Ching, which flows through the heart of Waltham Forest, have also been identified for rewilding. This will not only improve water quality but provide habitats for aquatic species, create more green spaces for local people and provide opportunities for outdoor classrooms and walking and cycling routes.
- 22.29 The 12 spaces along the Ching could, if installed, enable the river to achieve good ecological status<sup>22</sup>.

### **The Role of the Council**

- 22.30 As the Local Planning Authority (LPA) LB Waltham Forest Council has the responsibility, in accordance with the National Planning Policy Framework (NPPF) Chapter 14 'Meeting the Challenge of climate change, flooding and coastal change', to ensure that flood risk is understood and managed effectively through all stages of the planning process. As such, LB Waltham Forest is required to undertake a Strategic Flood Risk Assessment (SFRA) to form part of the evidence base for the preparation of their Local Plan.
- 22.31 The Council has completed a Level 1 SFRA to support the development of its Local Plan to 2035<sup>23</sup>. The aim of the revised Level 1 SFRA is to identify the spatial variation in flood risk across the Borough from all sources, facilitating a borough-wide comparison of future development sites with respect to flood risk considerations.

### **Flooding in Waltham Forest**

- 22.32 The River Lee and its tributaries the Ching Brook and Dagenham Brook are dominant features in the Borough and flooding from these watercourses has occurred a number of times in the last 100 years, during which many homes and businesses were affected.
- 22.33 Potential risk of flooding from other sources exists throughout the Borough, including surface water flooding and groundwater emergence. As the Lead Local Flood Authority (LLFA), LB Waltham Forest takes the lead in flood incident reporting from these sources and has compiled a database of significant flood events in the Borough.

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<sup>22</sup> Thames21 (2018) <https://www.thames21.org.uk/communitymodelling/rewilding-the-ching-brook/>

<sup>23</sup> <https://www.walthamforest.gov.uk/node/1550>

### Waltham Forest Blue Infrastructure Principles

- The borough will seek to de-culvert and 're-wild' the river corridors and water bodies of Waltham Forest in partnership with community groups, neighbouring authorities and environmental organisations. Opportunities will be sought to facilitate landscape scale projects that address issues related to flooding, biodiversity and water quality.
- The borough's network of rivers will be protected as key linear routes for wildlife and recreation.
- New development will be required to consider the borough's 'blue network' early within the design process to ensure opportunities are maximised to improve the ecological value of the network, access for recreation and naturalisation of the river corridor and associated habitats. New development should be appropriately set back from water courses, leaving an appropriate natural buffer to allow environmentally sensitive design and management treatments.
- Opportunities should be sought for the incorporation of Sustainable Drainage Systems (SuDS) within new development and retrofitting within existing, alongside the overall reduction of hard impervious surfaces.
- Appropriate intervention for naturalisation or rewilding along the borough's river corridors shall be undertaken where possible. This may include reprofiling of riverbanks to encourage marginal vegetation and safe pedestrian access; additional planting for wildlife and to improve water quality; and installation of 'soft' flood management in favour of hard infrastructure. Where feasible, culverted, piped or covered waterways should be opened up.
- Opportunities will be sought to undertake enhancements of the blue network within the borough's open spaces and proposals will be supported that seek to improve the water quality of rivers and water bodies.

### Assessing Flood Risk

22.34 The NPPF1 and associated PPG for Flood Risk and Coastal Change2 emphasise the active role LPAs such as LB Waltham Forest should take to ensure that flood risk is assessed, avoided, and managed effectively and sustainably throughout all stages of the planning process. The overall approach for the consideration of flood risk set out in Section 1 of the PPG can be summarised as follows:



## **Flooding & Climate Change**

- 22.35 In the future, climate change is anticipated to have an impact on all sources of flood risk within the Borough. It is important that planning decisions recognise the potential risk that increased runoff poses to property and plan development accordingly to ensure that development is appropriately flood resilient and resistant, safe for its users for the development's lifetime and will not increase flood risk overall.

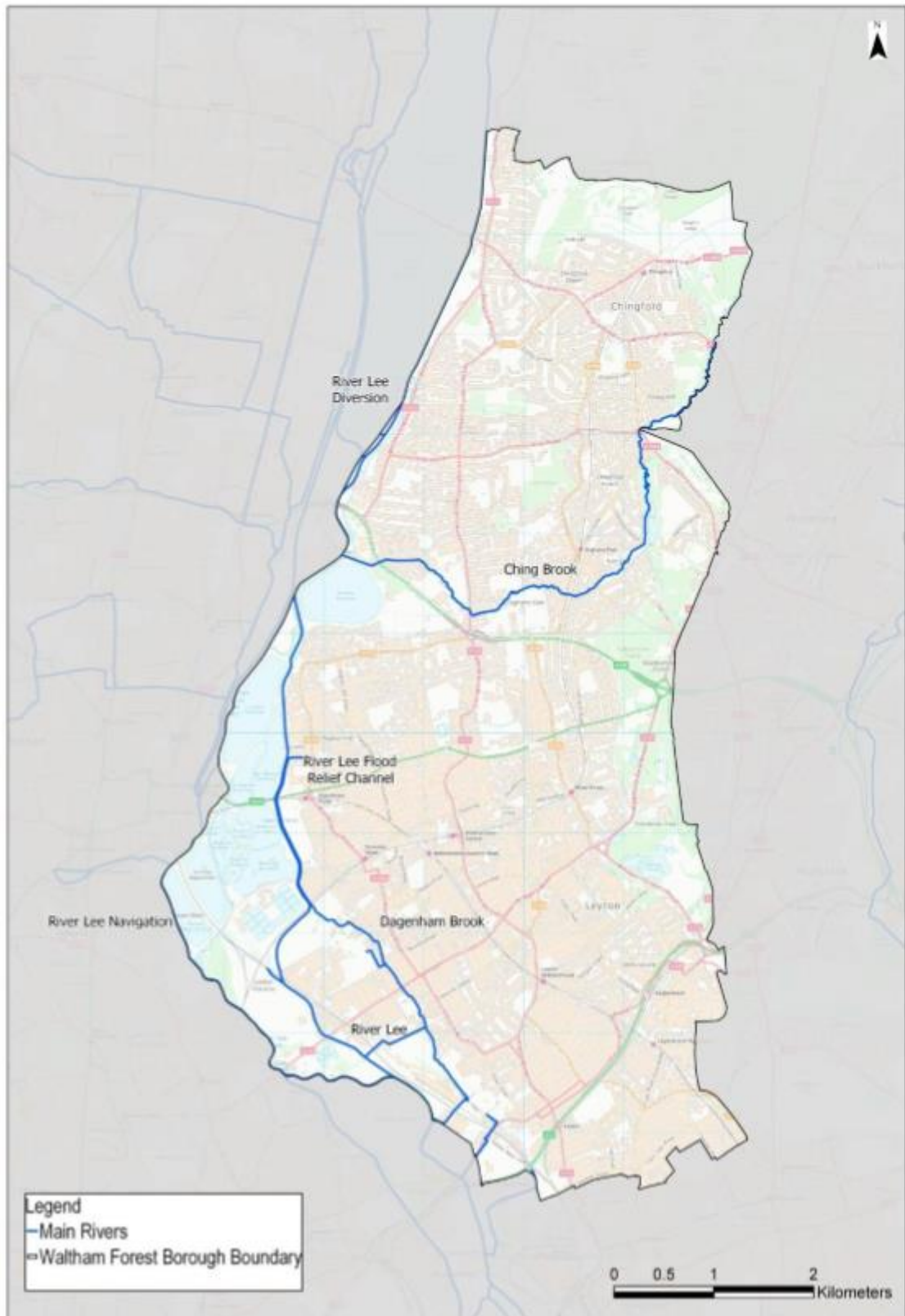
## **Rivers in the Borough**

- 22.36 All watercourses in England and Wales are classified as either 'Main Rivers' or 'Ordinary Watercourses'. The difference between the two classifications is based largely on the perceived 'importance' of the watercourse with particular reference to its potential to cause significant and widespread flooding.
- 22.37 There are three Main Rivers present within the Borough (River Lee, Ching Brook and the Dagenham Brook) as described below:

### **The River Lee**

- 22.38 The River Lee is located along the southern and western boundary of the Borough (as shown in Figure 22.2. The River originates near Luton and flows through Bedfordshire, Hertfordshire and London. The river drains an area of approximately 1400km<sup>2</sup> before meeting the River Thames at Bow Creek.
- 22.39 The Lower River Lee is largely an artificial watercourse containing multiple channels. As the River Lee enters the north western corner of the borough – immediately to the north of the William Gurling reservoir – it flows along the eastern bank of the William Gurling reservoir within the River Lee Diversion channel until it reaches south of the Lockwood Reservoir.
- 22.40 The River Lee Flood Relief Channel flows from the River Lee Diversion, to the west of the Banbury Reservoir, through the borough along the eastern edges of the reservoirs (located to the south west of the Borough) and joins the River Lee at Hackney Marsh, to the south of the borough.
- 22.41 The River Lee Navigation flows into the borough to the west of the Banbury Reservoir and flows along the western edge of the borough. In addition to being designated a Main River, the Lee Navigation is also part of the Canals and River Trust. Locks on the River Lee Navigation are administered by British Waterways.

Figure 22.2: Main Rivers in Waltham Forest



22.42 The naturalised River Lee flows to the south of the borough - to the east of Hackney Marsh - into the neighbouring London Borough of Newham.

### **Ching Brook**

22.43 The Ching Brook is located in the northern part of the LB of Waltham Forest (See Figure 22.2). The Ching Brook arises at Connaught Water as an ordinary watercourse flowing south. Where the Brook crosses under Whitehall Road, located along the north-eastern boundary of the borough it is then classified as a main river as it continues to flow south then west to enter the River Lee to the north of Banbury Reservoir. The total catchment area for the Ching Brook is 1747 hectares.

### **Dagenham Brook**

22.44 The Dagenham Brook rises along Priestley Way and flows south, parallel to the River Lee Flood Relief Channel, before flowing south east at Low Hall Sports Ground (see Figure 22.2). The Dagenham Brook continues to flow south east before joining the River Lee at New Spitalfields Market.

### **Fluvial Flooding**

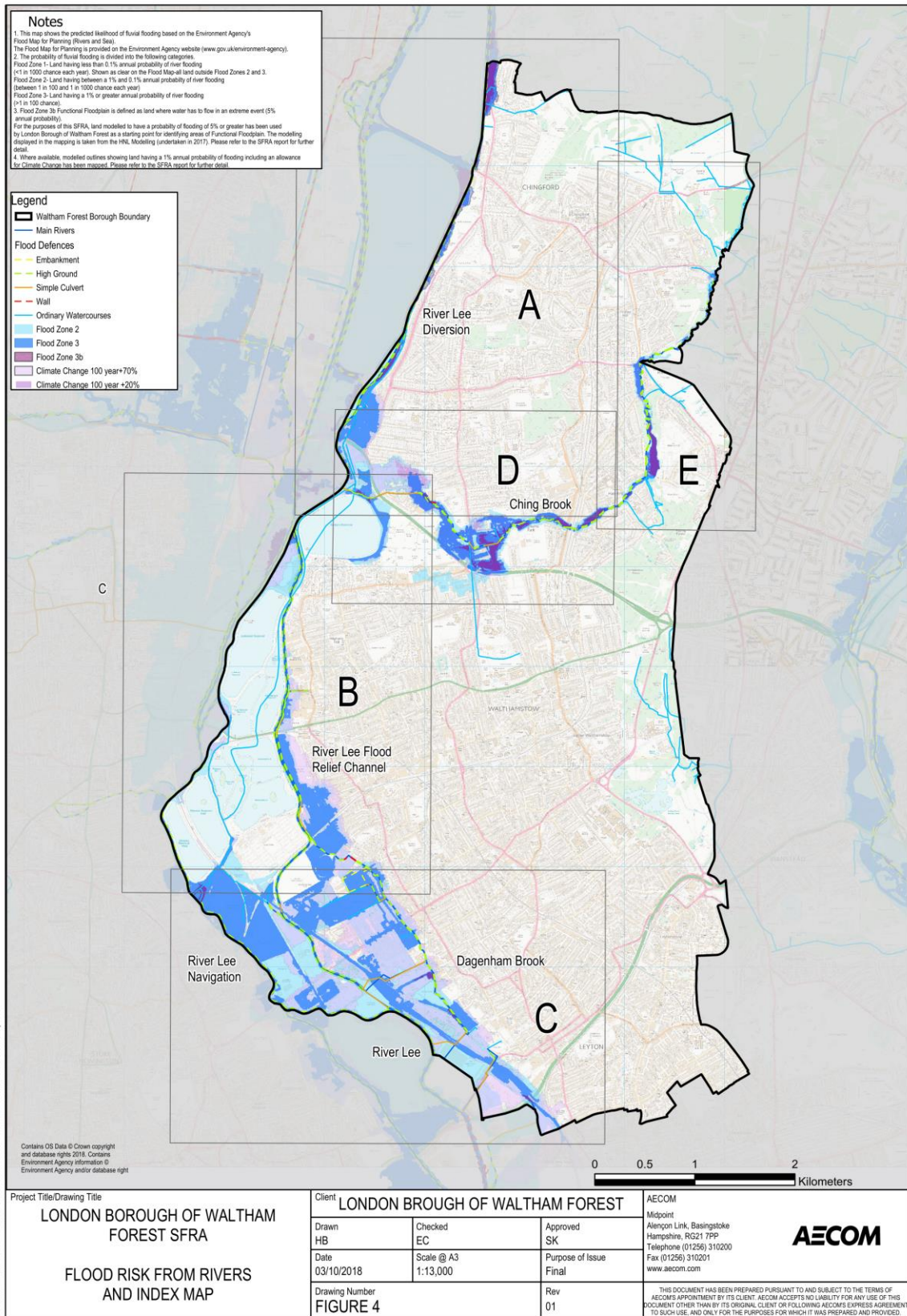
22.45 Flooding from rivers occurs when water levels rise higher than bank levels causing floodwater to spill across adjacent land (floodplain). The main reasons for water levels rising in rivers are:

- Intense or prolonged rainfall causing runoff rates and flows to increase in rivers, exceeding the capacity of the channel. This can be exacerbated by wet conditions and where there is significant groundwater base flow.
- Constrictions in the river channel causing flood water to back up; and
- Constrictions preventing discharge at the outlet of the river e.g. locked flood gates, or tide locking.

### **SFRA**

22.46 The Council has undertaken a Strategic Flood Risk Assessment (SFRA) Level 1 to support the development of the Draft Local Plan 2035. The aim of the Level 1 SFRA is to identify the spatial variation in flood risk across the Borough from all sources, facilitating a borough-wide comparison of future development sites with respect to flood risk considerations.

Figure 22.3: Flood Risk from Rivers in Waltham Forest



22.47 The Level 1 SFRA provides an overview of the risk of flooding from all sources across LB Waltham Forest Borough, including flooding from rivers, surface water, groundwater, sewers and other artificial sources, and should be used to assist in the development of policy formulation, strategic planning, and application of the Sequential Test, development control and emergency planning.

### Fluvial Flood Risk

- 22.48 Flooding from rivers occurs when water levels rise higher than bank levels causing floodwater to spill across adjacent land (floodplain). The main reasons for water levels rising in rivers are:
- Intense or prolonged rainfall causing runoff rates and flows to increase in rivers, exceeding the capacity of the channel. This can be exacerbated by wet conditions and where there is significant groundwater base flow.
  - Constrictions in the river channel causing flood water to back up; and
  - Constrictions preventing discharge at the outlet of the river e.g. locked flood gates, or tide locking.
- 22.49 The risk of flooding is a function of the probability that a flood will occur and the consequence to the community or receptor as a direct result of flooding. The NPPF1 seeks to assess the probability of flooding from rivers by categorising areas within the fluvial floodplain into zones of low, medium and high probability, as defined in Figure 22.4 and presented on the Flood Map for Planning (Rivers and Sea) available on the Environment Agency website<sup>24</sup>.

| Flood Zone    | Flood Zone Definition for River Flooding  | Probability of Flooding |
|---------------|---|-------------------------|
| Flood Zone 1  | Land having a less than 1 in 1,000 chance of river flooding each year (0.1% annual exceedance probability (AEP)). Shown as clear on the Flood Map – all land outside Flood Zones 2 and 3.   | Low                     |
| Flood Zone 2  | Land having between a 1 in 100 and 1 in 1,000 chance of river flooding each year (between 1% and 0.1% AEP).   | Medium                  |
| Flood Zone 3a | Land having a 1 in 100 or greater chance of river flooding each year (greater than 1% AEP).   | High                    |
| Flood Zone 3b | Land where water has to flow or be stored in times of flood, or land purposely designed to be flooded in an extreme flood event (flood storage area).<br><br>Flood Zone 3b is defined by the LPA, in this instance the 1 in 20 annual probabilities have been used to define Flood Zone 3b.<br>Note: Flood Zone 3b is not separately distinguished from Flood Zone 3a on the Flood Map for Planning (Rivers and Sea). | Functional Floodplain   |

Figure 22.4: Fluvial Flood Zones, extracted from NPPF

<sup>24</sup> <http://apps.environment-agency.gov.uk/wiyby/37837.aspx>



- 22.50 The Environment Agency 'Flood Map for Planning (Rivers and the Sea)' provides information on the areas that would flood if there were no flood defences or buildings in the "natural" floodplain. The 'Flood Map for Planning (Rivers and Sea)' dataset is available on the Environment Agency website and is the main reference for planning purposes as it contains the Flood Zones which are referred to in the NPPF.
- 22.51 This Environment Agency dataset has been used to define and illustrate Flood Zone 1, 2 and 3 on Figure 4 and 4A-E contained within Appendix A of this SFRA. The current proportions of the Borough located within Flood Zone 2 and 3 are shown below:
- Flood Zone 2- 482 hectares
  - Flood Zone 3- 222 hectares

### **Surface Water Flood Risk**

- 22.52 Overland flow and surface water flooding typically arise following periods of intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems. It can run quickly off land and result in localised flooding.
- 22.53 This source of flooding can be compounded when combined with impermeable sub-soils or significant areas of development with associated hard standing areas. As the majority of the study area is heavily developed, the risk of surface water flooding is increased.

### **Waltham Forest Surface Water management Plan (SWMP)**

- 22.54 The LB Waltham Forest Surface Water Management Plan (SWMP) undertook a comprehensive review of fluvial flood risk and identified Local Flood Risk Zones where surface water flooding may affect homes, businesses or infrastructure. This information was used to create a long-term action plan for the LB Waltham Forest to assist in their role as LLFA.
- 22.55 Thirteen critical drainage areas (CDAs) were identified, defined within the SWMP as 'a discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer and/or river) often cause flooding in a Flood Risk Area during severe weather thereby affecting people, property or local infrastructure'. In addition, three of these CDAs have been 'prioritised' by LB Waltham Forest Council as areas for action being;
- Chestnuts;
  - South Chingford; and,
  - Fillebrook.
- 22.56 The Council has also applied for funding to undertake flood studies for the Waltham Forest areas listed below, these areas tie in with potential development sites outlined within the new Local Plan. These sites now appear on the Thames Regional Flood &

Coastal Committee's<sup>25</sup> forward funding programme (refer to Thames RFCC's new schemes within the next six-year programme table attached above), our four new study areas are highlighted in yellow above.

- Waltham Forest North East – (Ching Corridor).
- Waltham Forest West – (Walthamstow Marshes).
- Waltham Forest South – (Leytonstone Corridor).
- Waltham Forest North West - (Sewardstone Corridor).

22.57 Once complete, almost the entire borough will have been assessed through detailed local drainage analysis and modelling. These schemes are identified in the [Infrastructure Delivery Schedule](#) in Appendix 1 of this document.

### **Risk of Flooding from Surface Water Mapping**

22.57 The latest version of Environment Agency surface water flood risk mapping is referred to as the 'Risk of Flooding from Surface Water Map' (RoFfSW) and the extents have been made available to LB Waltham Forest as GIS layers. This dataset is also available nationally on the Environment Agency website<sup>26</sup>, and is referred to as 'Risk of Flooding from Surface Water'<sup>27</sup>.

### **Groundwater Flooding**

22.58 Groundwater flooding usually occurs in low lying areas underlain by permeable rock and aquifers that allow groundwater to rise to the surface through the permeable subsoil following long periods of wet weather. Low lying areas may be more susceptible to groundwater flooding because the water table is usually at a much shallower depth and groundwater paths tend to travel from high to low ground.

22.59 There are many mechanisms associated with groundwater flooding which are linked to high groundwater levels and can be broadly classified as:

- Direct contribution to channel flow – where the river channel intersects the water table and groundwater enters the streambed increasing water levels and causing flooding;
- Springs erupting at the surface;
- Inundation of drainage infrastructure – potentially where drainage infrastructure has eroded over time;
- Inundation of low-lying property (basements).

22.60 The main impacts of groundwater flooding are:

- Flooding of basements of buildings below ground level – in the mildest case this may involve seepage of small volumes of water through walls, temporary loss of services etc. In more extreme cases larger volumes may lead to the catastrophic loss of stored items and failure of structural integrity;

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<sup>25</sup> <https://www.gov.uk/government/groups/thames-regional-flood-and-coastal-committee>

<sup>26</sup> <https://www.gov.uk/government/organisations/environment-agency>

<sup>27</sup> <https://flood-warning-information.service.gov.uk/long-term-flood-risk>

- Overflowing of sewers and drains, where high groundwater has either penetrated underground pipes or entered the sewer from the surface (or a combination of the two) – surcharging of drainage networks can lead to overland flows causing significant but localised damage to property. Sewer surcharging can lead to inundation of property by polluted water. Note: it is complex to separate this flooding from other sources, notably surface water, or sewer flooding;
- Flooding of buried services or other assets below ground level – prolonged inundation of buried services can lead to interruption and disruption of supply;
- Inundation of roads, commercial, residential and amenity areas – inundation of grassed areas can be inconvenient; however, the inundation of hard-standing areas can lead to structural damage and the disruption of commercial activity. Inundation of agricultural land for long durations can have financial consequences; and
- Flooding of ground floors of buildings above ground level – can be disruptive and may result in structural damage. In addition, typically a groundwater flood event will have a long duration (when compared to other flood sources) which adds to the disruptive nature of the flood event.

### **Flood Risk Management Infrastructure**

22.61 There are two main categories of flood defences, formal and informal. Formal defences are specifically constructed to control floodwater. Informal defences include structures that have not necessarily been constructed for this purpose but do have an impact on retaining flood water, such as railway and road embankments or other linear infrastructure such as boundary walls and buildings. The flood defences located along the watercourses within the Borough are described below.

#### **River Lee**

22.62 The modified and unmodified sections of the River Lee are protected by a number of hard defences. The Environment Agency AIMS data identifies the type and standard of protection provided by the defences along the watercourse. These are shown below in Figure 22.5 below.

Figure 22.5: Standard of flood protection provided by flood defences in Waltham Forest

| <b>Watercourse name</b>        | <b>Defence type</b> | <b>Standard of protection offered</b> |
|--------------------------------|---------------------|---------------------------------------|
| River Lee Diversion            | High Ground         | 1 in 5 year to 1 in 50 year event     |
| River Lee Flood Relief Channel | High Ground         | 1 in 5 year to 1 in 70 year           |
| River Lee Navigation           | High Ground         | 1 in 2 year to 1 in 50 year           |

#### **Dagenham Brook**

22.63 The flood defences for the Dagenham Brook are shown below in Figure 22.6 below.

Figure 22.6: Dagenham Brook flood defences

| Watercourse name | Defence type | Standard of protection offered |
|------------------|--------------|--------------------------------|
| Dagenham Brook   | Embankment   | 1 in 5 year to 1 in 200 year   |
|                  | High Ground  | 1 in 5 year to 1 in 10 year    |
|                  | Culvert      | 1 in 5 year                    |
|                  | Flood Wall   | 1 in 70 year                   |

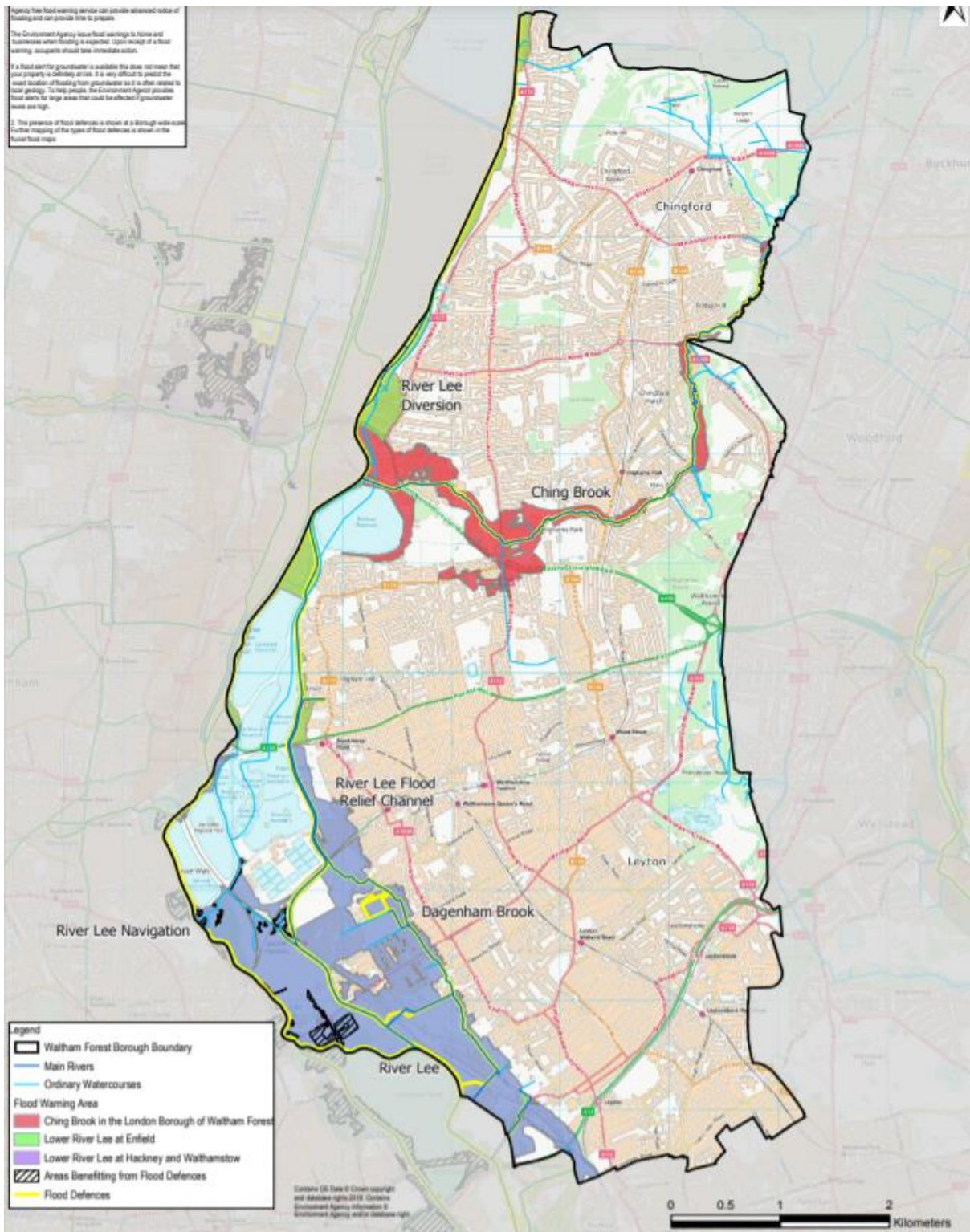
### Ching Brook

22.64 The flood defences for the Ching Brook are shown below in Figure 22.7 below.

Figure 22.7: Ching Brook flood defences

| Watercourse name | Defence type | Standard of protection offered |
|------------------|--------------|--------------------------------|
| Ching Brook      | Flood Wall   | 1 in 25 year                   |
|                  | Culvert      | 1 in 2 year                    |
|                  | High Ground  | 1 in 2 year to 1 in 200 year   |

Figure 22.8: Flood warning areas and areas benefiting from flood defences



## Maintenance of Flood Defence Infrastructure

22.65 The future sustainability of the Borough (and London as a whole) is dependent to a large degree upon the retention and ongoing maintenance of flood defence infrastructure, including the River Lee Defences. However, decisions surrounding investment of this nature in future years cannot be predicted with any certainty. Additionally, the exact impact of climate change, and the interaction of the resulting

hydrological effects with operational and wider issues is still uncertain. It is therefore imperative that planning decisions are taken with a clear understanding of the potential risks posed to property and life should things ultimately go wrong. As such, redevelopment must ensure that residual flood risk is reduced in areas benefiting from flood defence measures through prevention and effective mitigation.

22.66 Management of defences within the Borough will include routine inspection, maintenance, repair and replacement, in addition to eventual raising of levels to allow for the impact of climate change. However, raising the level of defences on the current footprint may introduce visual barriers and will not achieve any wider sustainability objectives. Therefore, opportunities will be pursued for subsequent improvement of the riverside through integrated design, considering public access and connectivity, amenity, landscaping and environmental enhancement.

22.67 As such, where fluvial defences require replacement, consideration should be given to flood defence adaptation rather than like-for-like replacement, utilising a combination of flood storage, river defences and floodplain attenuation.

- Raising existing flood defences to the required levels in preparation for future climate change impacts or otherwise demonstrate how flood defences can be raised in the future, through submission of plans and cross-sections of the proposed raising;
- Demonstrating the provision of improved access to existing flood defences and safeguarding land for future flood defence raising and landscape, amenity and habitat improvements;
- Maintaining, enhancing, or replacing flood defences to supply adequate protection for the lifetime of the development;
- Where opportunities exist, re-aligning or setting back flood defence walls and improving the river frontage to provide amenity space, habitat, access and environmental enhancements; and
- Securing financial contributions towards the anticipated costs of flood risk management infrastructure required to protect the proposed development over its lifetime.

### **SFRA 2 and Next Steps**

22.68 The Level 1 SFRA identifies the floodplain areas associated with the River Lee and Ching Brook and presents Flood Zone Maps that delineate the flood zones outlined in the NPPF.

22.69 Given the position of the Borough adjacent to the River Lee and Ching Brook, it is highly reliant on flood defences. Ongoing maintenance of these defences is critical, and priority should be given to safeguarding the standard of protection provided by defences over the lifetime of any development.

22.70 The Council is currently undertaking a SFRA Level 2 to further support the Local Plan to 2035.

# 23. Green & Blue Infrastructure - Strategic Projects

- 23.1 The National Planning Policy Framework (NPPF) 2019<sup>28</sup> provides the following definitions of Green Infrastructure:  
*'A network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities.'*
- 23.2 The definition within the London Environment Strategy<sup>29</sup> reflects this definition, providing additional detail on the benefits:  
*'London's **green infrastructure** is the network of parks, green spaces, gardens, woodlands, rivers and wetlands (as well as features such as street trees and green roofs) that is planned, designed and managed to:*
- Promote healthier living
  - Lessen the impacts of climate change
  - Improve air quality and water quality
  - Encourage walking and cycling
  - Store carbon
  - Improve biodiversity and ecological resilience
- 23.3 Recognition of the multi-functional nature of green and blue infrastructure is of particular importance. When considering any green or blue infrastructure asset, it is likely that several functions will be identified, and several benefits derived. A high quality and value urban park will, for instance, provide areas for informal and organised recreation, contribute to the active travel network, provide opportunities for education, space for wildlife, reduce surface water runoff and mitigate against air pollution.
- 23.4 It is also important to note that green and blue infrastructure can be in public or private ownership and be in any condition. Green and blue infrastructure is essential for maintaining a good quality of life and healthy living environment. It is therefore increasingly understood that green and blue infrastructure must be considered and planned for alongside other forms of infrastructure, such as 'grey' infrastructure. It is also now widely recognised that investment in nature-based solutions for issues that may need to be addressed during growth and development is a viable and beneficial alternative to highly engineered or 'hard' solutions that may have additional costs and not provide multiple benefits.

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<sup>28</sup> Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework

<sup>29</sup> Mayor of London (2018) London Environment Strategy



- 23.5 In summary this, the Council's Green & Blue Infrastructure Strategy 2020 considers the following types of green and blue infrastructure (section four provides further detail):
- Publicly accessible open spaces such as parks and gardens, and natural and semi-natural sites
  - Other types of open space and vegetation which may not be publicly accessible
  - Rivers/ watercourses, Sustainable Drainage Systems (SuDS) and bodies of water
  - Incidental areas of vegetation within urban areas such as Space Left Over After Planning (SLOAPS)
  - Allotments and productive landscapes
  - Street trees
  - Green/ brown roofs
  - Green walls
  - Private gardens
- 23.6 Of particular importance to developing the Council's strategy for green and blue infrastructure has assessing the connectivity and the 'integrity' of the existing network, and where there are gaps and opportunities to strengthen the network. How well connected and permeable the network is can have a major effect on the benefits provided to wildlife and people.
- 23.7 By identifying the key assets within the borough, this strategy will help to ensure future development is considerate of what makes green and blue infrastructure within Waltham Forest distinctive. The borough's location, sandwiched between two regional parks of significant ecological importance, Epping Forest and Lee Valley, is a distinguished characteristic of the borough. Furthermore, its cultural legacy following the 2012 Olympics and the 2019 London Borough of Culture has played a fundamental role in the improvement of its open spaces.
- 23.8 The borough has previously benefitted from funding from the London Mayor's Mini-Holland cycling scheme, which has significantly increased opportunities for cycling. The council has built on this success through 'Enjoy Waltham Forest' which aims to make the borough more enjoyable for everybody through several measures including urban greening and the creation of new outdoor space. Both schemes are examples of the potential for good quality green infrastructure in Waltham Forest and should be expanded on in future projects.

### **Walthamstow Wetlands**

- 23.9 Walthamstow Wetlands is the capital's largest urban wetland nature reserve, providing a special home to many important wildlife species. The nature reserve encompasses 10 large reservoirs, which deliver water to 3.5 million Thames Water customers. Visitors can experience peace and quiet, while getting closer to nature and discovering the

fascinating history of this unique urban nature reserve, and enjoy refreshments in the café, situated in the Engine House Visitor Centre. For those wishing to run or cycle, there is a dedicated path that allows enjoyment of the nature reserve without disturbing the wildlife.

- 23.10 Walthamstow Wetlands is internationally important for wildlife, especially for migrating waterfowl. A Site of Special Scientific Interest, it forms part of the Lee Valley Special Protection Area and is included in The Ramsar List of Wetlands of International Importance.
- 23.11 Walthamstow Wetlands are an increasingly important asset and open space for Waltham Forest, and on-going investment is required to ensure the site is well maintained, as a nature reserve and visitor attraction and to meet social and environmental objectives. Future plans will explore new ways to maximise opportunities to interact with the unique environment whilst protecting and enhancing the wildlife and natural environment.
- 23.12 The on-going revenue costs to manage and maintain the Walthamstow Wetland are forecast to be £5.54 million over the next twenty years. Given the new and agreed new homes in the environs of the Wetlands, developers' contributions will be sought to cover the ongoing costs of the asset to support the delivery of liveable places. There will be a continued review of costs and alternative sources of funding to ensure that the Walthamstow Wetlands are effectively maintained and opportunities for further enhancements are maximised.

### **Strategic Green & Blue Infrastructure Projects to 2035**

- 23.13 The Green & Blue Infrastructure Study identifies several strategic projects to support the long-term enhancement of the boroughs green and blue infrastructure networks. These are:
- A. Meridian Water Link
  - B. Connecting Leyton's Sports Hubs
  - C. The Highams Park: heritage, open space and biodiversity improvements
  - D. Protecting and enhancing Woodford New Road green corridor
  - E. River Ching and South Chingford wetlands: flood alleviation, water quality and biodiversity
  - F. River Ching Local Blue Ribbon: Gateways and interpretation
  - G. Low Hall: access, interpretation & biodiversity improvements
  - H. Sewardstone Gateway to the Countryside
  - I. North Chingford Gateway to the Forest

J. Whipps Cross development

K. Urban greening opportunities along A12

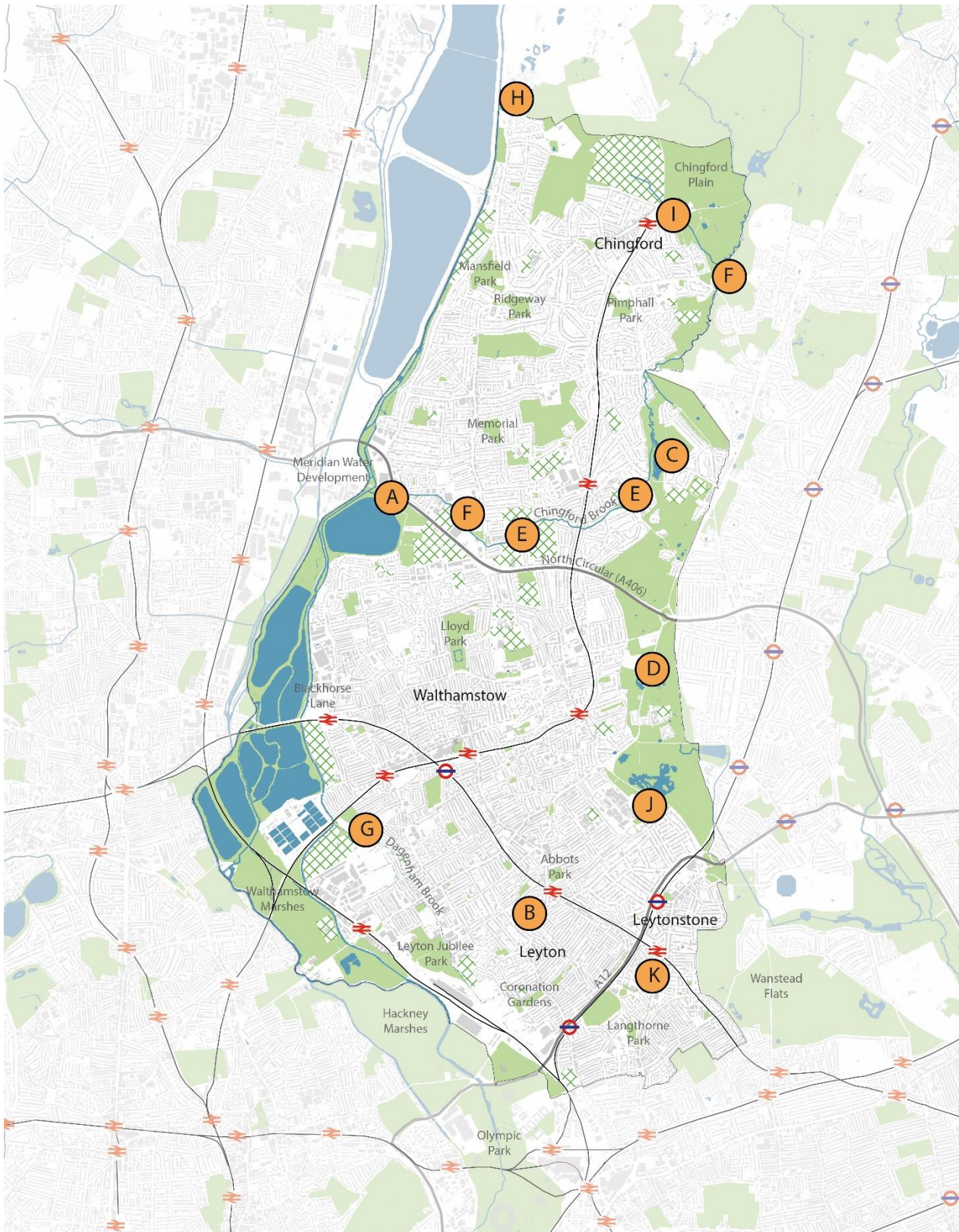


Figure 23.1: Proposed Strategic Green & Blue Infrastructure Projects to 2035

| Strategic Projects            | Summary  | Key Drivers/Issues  | Potential Partners   | Key G&BI Themes  | Outline Estimated Budget |
|-------------------------------|--|---|--|--|--------------------------|
| <b>A. Meridian Water Link</b> | <p>Access, biodiversity and water environment improvements along the North Circular corridor adjacent to the Banbury Reservoir at the western borough boundary. Engagement with Enfield Council will ensure good access for pedestrians and cyclists between the two boroughs; connecting to the Meridian Water Regeneration Area in Enfield and existing north-south active travel routes towards Walthamstow Wetlands. Meridian Water Regeneration area is a major regeneration project within the London Borough of Enfield. The area adjoins Waltham Forest on the western boundary where the North Circular (A406) crosses the River Lee Navigation. The area includes a new railway station and will see the building of 10,000 homes and the creation of thousands of jobs. To the north of this area further regeneration and growth will be seen around Edmonton Leaside Employment and Industrial Estates. The vision for growth in the area is detailed within Edmonton Leaside Area Action Plan, which highlights the significant opportunities for addressing issues around connectivity, access to green space and delivering wider environmental improvements. Summary of interventions:</p> <ul style="list-style-type: none"> <li>• Provision of a safe pedestrian and cycle route as an alternative to the north circular; linking the Mini-Holland network (Leyton to Chingford Cycle Route) to the Lee Valley Walk at the River Lea. To include tree planting, signage and improvements to streetscape/highway and sense of safety at Folly Lane. Improved access to the pedestrian footbridge from Greenham Crescent north of the A406.</li> <li>• Improvements to Folly Lane Community Woodland including vegetation management, habitat works, seating and boundary treatments to improve sense of security. Connect Folly Lane with the existing footbridge over the A406 through provision of a surfaced route</li> </ul> | <ul style="list-style-type: none"> <li>• The surrounding wards include areas that are within the 20% most deprived (IMD) areas in the country.</li> <li>• Areas of flood risk occur adjacent to Banbury Reservoir and upstream along the River Ching and its confluence with the River Lea.</li> <li>• Water quality in adjacent water courses is poor. Sections of the A406 are considered 'extremely polluted' and listed amongst London's roads at most risk of causing damage to river health.<sup>84</sup></li> <li>• Open spaces generally are of low quality and areas with deficiency in access to open space are located to the north, east and south.</li> <li>• The North Circular and nearby waterbodies are considerable barriers, restricting sustainable travel and access to open space.</li> <li>• Air quality along the adjacent section of the A406 is amongst the worst areas in the borough.</li> <li>• The area is included within North Circular Strategic Location and includes one of the borough's Strategic Industrial Locations.</li> </ul> | <p>London Borough of Enfield</p> <p>Environment Agency</p> <p>Transport for London</p> <p>Thames Water</p> | <p>Access and Connectivity</p> <p>Biodiversity and Conservation</p> <p>Blue Infrastructure</p> <p>Open Space</p> <p>Urban Greening</p> | <b>£2 million</b>        |

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|  | through Folly Lane Community Woodland. Subject to scoping, implement a SuDS scheme to reduce surface water run-off from the A406 adjacent to the road and within Folly Lane Community Woodland to improve water quality in surrounding waterbodies. Seek opportunities to naturalise heavily modified sections of the River Ching and improve management of marginal river habitat.  |   |   |  |                     |
| <b>B. Connecting Leyton's Sports Hubs</b>            | <p>Recent investment has significantly improved the sports offer at Leyton Cricket Ground. Improved cycling and walking connections between open spaces and provision of urban greening is now required to improve access.</p> <p>Summary of interventions:</p> <ul style="list-style-type: none"> <li>• Provide walking and cycling routes through the provision of signage and streetscape improvements between local open spaces including Leyton Cricket Ground, Jack Cornwell Park, Leyton Manor Park and Abbotts Park. Provide a cycling and walking route between Leyton Cricket Ground and grass sports pitches at Hackney Marshes via Marsh Lane and Leyton Jubilee Park.</li> <li>• Make improvements for transporting bicycles across the existing pedestrian footbridge over the railway sidings at Orient Way.</li> <li>• Make improvements for cyclists along the Mini-Holland network at High Street Leyton, better connecting Leyton Cricket Ground, local open spaces, transport hubs, Leyton Sports Centre and Baker's Arms District Centre.</li> <li>• Identify suitable sites and implement urban greening measures including tree planting and SuDS along cycling and walking routes and towards the District Centre at Bakers Arms.</li> </ul> | <ul style="list-style-type: none"> <li>• There is a deficiency in access to several types of open spaces in the surrounding area.</li> <li>• The surrounding wards include areas that are within the 20% most deprived (IMD) areas in the country.</li> <li>• High Street Leyton and Hoe Street suffers from poor air quality in places.</li> <li>• The area is within and adjacent to Bakers Arms Strategic Location, which includes Baker's Arms District Centre.</li> <li>• High Road Leyton is included within the Mini-Holland Network (Leyton to Chingford Cycle Route). There are areas that are at risk of surface water flooding (1 in 30 year event) to the north and east of Leyton Cricket Ground and Leyton Midland Road Station.</li> </ul> | <p>Transport for London</p> <p>London Borough of Hackney</p> <p>Lee Valley Regional Park Authority</p> <p>National Rail</p> | <p>Access and Connectivity</p> <p>Open Space</p> <p>Urban Greening</p>                 | <b>£2.5 million</b> |
| <b>C. The Highams Park: heritage, open space and</b> | There are opportunities to work with City of London Corporation (CoL) and other stakeholders to develop a strategy and improvement programme for the historic landscape at The Highams Park. The landscape is locally designated as a Park and Garden of Historical Interest. The original landscape is fragmented between different owners (City of London, London Borough of Waltham Forest and Woodford County High School), which has contributed to   | <ul style="list-style-type: none"> <li>• The site is contiguous with Epping Forest SAC.</li> <li>• The remnants of the historic landscape are under multiple ownership and are not managed in a co-ordinated way.</li> </ul>  | <p>City of London Corporation</p> <p>Highams Park Community Interest Company</p>  | <p>Access and Connectivity</p> <p>Biodiversity and Conservations</p> <p>Open Space</p> | <b>£750,000</b>     |

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| <b>biodiversity improvement</b>                      | <p>an overall loss of design and makes it difficult for visitors to appreciate the historic value of the site. The site is an important local park but key entrances are on relatively small residential roads and not well located in relation to public transport links. Summary of interventions:</p> <ul style="list-style-type: none"> <li>• Work with stakeholders to develop a management strategy and improvement programme for the remnants of the historic landscape. Such a strategy should have regard for City of London's Individual Site Plan for The Highams Park, Little Sale Wood and Oak Hill Wood. Develop the non-SAC section of the site as a key alternative recreational space to protect important ecological features of the SAC.</li> <li>• Appropriate tree planting, wildflower seeding within park.</li> <li>• Improvements to the quality of permissive paths and public rights of way, linking to Epping Forest Centenary Walk. Improve the connection to White House Woods providing signage and road crossing improvements at The Charter Road.</li> <li>• Entrance improvements to include directional signage from nearby bus stops on The Avenue to the north. Improve the Keynsham Avenue/Tamworth Avenue entrances to improve sense of safety, provision of signage. Wildlife friendly planting/wildflower planting at entrances. Liaise with City of London to determine the suitability of improving pedestrian access at the A1009.</li> <li>• Liaise with Redbridge Borough Council over the feasibility of creating a promoted heritage cycle/walking route between The Highams Park and Claybury Park (both Humphry Repton parkland commissions) via Roding Valley Park to divert some users away from Epping Forest SAC</li> </ul> | <ul style="list-style-type: none"> <li>• The site is within an area considered amongst the 20% most deprived (IMD) in the country.</li> <li>• Waltham Forest Open Space Study Strategy Action 39.</li> </ul>  |  | Cultural Heritage  |                   |
| <b>D. Protecting and enhancing Woodford New Road</b> | <p>Woodford New Road connects Whipps Cross Hospital roundabout with High Road/Woodford Green on the borough boundary. Poor air quality is having an adverse effect on the nearby SAC and SSSI, including the council owned and managed White House Woods. Summary of interventions:</p>  | <ul style="list-style-type: none"> <li>• Poor air quality in the area is having an adverse effect on important ecological assets at Epping Forest SAC.</li> <li>• The road passes by White House Woods (Epping Forest SSSI unit 203), which is owned and managed by Waltham Forest</li> </ul> | Natural England<br><br>TFL<br><br>City of London Corporation | Access and Connectivity<br><br>Biodiversity and Conservation<br><br>Urban Greening | <b>£8 million</b> |

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| <p><b>green corridor</b></p>  | <ul style="list-style-type: none"> <li>• Provision of segregated cycle lanes, connecting recent improvements at Whipps Cross Interchange to Woodford Green on the borough boundary. Junction improvements and traffic calming measures to promote a modal shift and improve air quality. Tree planting, wildflower seeding where possible and appropriate to create improved wildlife corridor.</li> <li>• Connect the route with the existing Mini-Holland scheme (Lea Bridge Road Cycle Route, Bloomsbury to Walthamstow Quietway and Forest Road to Wood Street).</li> <li>• Improved habitat management at White House Woods.</li> </ul>  | <p>Council and is considered to be in unfavourable condition by Natural England primarily due to poor air quality.</p>  |  |   |                            |
| <p><b>E. River Ching and South Chingford wetlands: flood alleviation, water quality and biodiversit</b></p> | <p>Implement a catchment-based approach to providing flood alleviation, improving water quality and reducing polluted water runoff through constructed wetlands in open spaces. The council has identified Memorial Park, Larkswood Playing Field and Rolls Sports Ground as key sites for flood alleviation schemes in South Chingford to protect properties from flooding events. Proposed schemes present significant opportunities to provide improved amenity and biodiversity benefits. Several other sites have been identified by partners, such as Thames 21, with potential for wetland construction and SuDS that would contribute to improved water quality within the River Ching.</p> | <p>Summary of interventions:</p> <ul style="list-style-type: none"> <li>• Delivery of constructed wetland and flood storage at Larkswood Playing Field, Memorial Park and Rolls Sports Ground. Planting and access improvements to ensure maximum benefits for amenity, biodiversity and opportunities for education and engagement.</li> <li>• Subject to further scoping, implement multifunctional SuDS or wetland creation within open spaces identified as having the most benefit for improving water quality including The Highams Park, Parmiters and Cavendish Sports Ground, Hale End Sports Ground and River Ching Walkway.</li> <li>• Identify opportunities within other open spaces along the river corridor where river edge management can be improved and surface water runoff reduced through SuDS such as Brookfield Allotment Site, The Ching and Brookfield Meadow, Highams Park School Playing Field, Hollywood Way Allotment Site, Wickham Road Allotment Site, Peter May Sports Centre, Wadham Avenue Open Space, Walthamstow Stadium, Ching Walkway, Hoxton Manor Allotments, Blades &amp; Salisbury Hall Playing Fields.</li> </ul> | <p>Several properties in South Chingford are at risk from surface water flooding.</p> <p>The River Ching suffers from poor water quality, which has been partly attributed to runoff from adjacent roads, such as the A406.</p> <p>Waltham Forest Open Space Study Strategy Action 28.</p> | <p>Access and Connectivity</p> <p>Cultural Heritage</p> | <p><b>£1.5 million</b></p> |

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|  |  | <ul style="list-style-type: none"> <li>• Work with the City of London Corporation, Environment Agency and other partners to progress proposals for Natural Flood Risk Management measures at Whitehall Plain, including Leaky Dams and development of wet woodland habitat.</li> </ul>  |   |   |                     |
| <b>F. River Ching Local Blue Ribbon: Gateways and interpretation</b>       | <p>A continuous riverside path should be created where possible along the River Ching. This could create sustainable transport opportunities for residents and visitors on foot and bike, providing opportunities for education and community involvement.</p> <p>Summary of interventions:</p> <ul style="list-style-type: none"> <li>• Provision of 'Gateways' to the river including interpretation at several</li> <li>• locations and signposting to these entrances (Gateway locations to be</li> <li>• considered at Whitehall Plain / Whitehall Road, A112 and Morrisons car</li> <li>• park).</li> <li>• Improvements to any path surfacing running nearby the river's edge,</li> <li>• where required.</li> <li>• Vegetation management and rivers edge improvements where possible</li> <li>• and appropriate.</li> </ul> | <ul style="list-style-type: none"> <li>• The River runs through several wards that are within the 20% most deprived (IMD) areas in the country.</li> <li>• The watercourse runs through several areas with deficiencies in good local access to open space.</li> <li>• The route connects several heritage assets.</li> </ul>   | <p>Thames 21</p> <p>Environment Agency</p> <p>City of London Corporation</p> <p>Ching Brook Action Group</p>                  | <p>Access and Connectivity</p> <p>Cultural Heritage</p>   | <b>£1.5 million</b> |
| <b>G. Low Hall: access, interpretation &amp; biodiversity improvements</b> | <p>Improved access to open space, interpretation and ecological management along the Dagenham Brook at Low Hall Conservation Area (Site of Local Importance to Nature Conservation - SLINC).</p> <p>The proposed development at Low Hall Depot also provides the opportunity to open up access and improve ecological quality of the Dagenham Brook and provide improved amenity as part of multifunctional flood storage. The area is connected to the Black Path; a historic route running between Columbia Road Flower Market and Walthamstow, passing Broadway Market and Smithfield. Today the path is used for walking and cycling and is part of the local cycle network. Improvements to the route as it</p>   | <ul style="list-style-type: none"> <li>• The Dagenham Brook is periodically subject to wastewater overflow due to lack of capacity in the storage network and surface water runoff.</li> <li>• The area is at risk from Fluvial and surface water flooding events.</li> <li>• Surrounding areas are deficient in access to open space.</li> <li>• The project area is included within Low Hall Strategic Location.</li> </ul> | <p>Environment Agency</p> <p>Conservation organisations</p> <p>Local interest groups</p> <p>Thames 21</p> <p>Thames Water</p> | <p>Access and Connectivity</p> <p>Biodiversity and Conservation</p> <p>Blue Infrastructure</p> <p>Open Space</p> <p>Cultural Heritage</p> | <b>£750,000</b>     |



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|   | <p>runs along Markhouse Avenue and South Access Road would result in better connectivity for cyclists wishing to journey between Walthamstow and Orient Way, Lee Valley and Lea Bridge Road. Summary of interventions:</p> <ul style="list-style-type: none"> <li>•Ensure configuration of future development at the Low Hall Depot allows for pedestrian/cycle access along the Dagenham Brook. Built development shall be set back from the river's edge to allow for regrading/reprofiling and improved habitat quality. Design should incorporate additional open space, high quality play and retention and improvement of multifunctional flood storage area as a community amenity.</li> <li>•Creation of a new entrance adjacent to the Brook on South Access Road at Low Hall conservation area, creating a continuous path along the brook. Entrance/boundary treatments, entrance surfacing, signage/interpretation. Creation of a route parallel to the brook connecting to the existing woodland walk at the west of the site.</li> <li>•Develop and promote St James Park, Low Hall Conservation Area and Low Hall Sports Ground as a single site with consistent signage and improved access between the north and south.</li> <li>•Extend habitat areas adjacent to SLINC, north of the Sports Fields to include reprofiling rivers edge/swale creation, tree/scrub and wildflower planting for pollinators.</li> <li>•Provision of community food growing area/orchard within St James Park.</li> <li>•Create a route with directional signage linking the cycle filter at South Access Road/Argall Avenue with the rain garden at Essex Road/Salop Road.</li> <li>•Provision of directional signage from public transport links and the MiniHolland Network (Leyton)</li> </ul> |   |   |   |                          |
| <p><b>H. Sewardstone Gateway to the Countryside</b></p> | <p>Develop Sewardstone Road as a gateway to the borough and out to the surrounding countryside whilst also providing better connections to transport hubs at Chingford and Ponders End in Enfield. Provide better local access to the countryside and open space in the local area to direct some footfall away from Epping Forest SAC. Summary of interventions:</p>   | <ul style="list-style-type: none"> <li>• Sewardstone Rd is identified as a Strategic Location in the local plan. The area surrounding the Sewardstone Rd/Kings Head Hill junction is designated as a neighbourhood centre.</li> </ul> | <p>Transport for London</p> <p>Lee Valley Regional Park Authority</p> | <p>Access and Connectivity</p> <p>Biodiversity and Conservation</p> <p>Urban Greening</p> | <p><b>£3 million</b></p> |

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|   | <ul style="list-style-type: none"> <li>• Connect Sewardstone Rd/Kings Head Hill/Lea Valley Rd junction with the Mini-Holland Network (Leyton to Chingford Cycle Route) at the A110/A1069 junction – linking with routes such as the London Loop, Epping Forest Centenary Walk and the footpath along the River Lee navigation. Markings, signage and junction improvements.</li> <li>• Improve character, legibility and environmental quality of Sewardstone Rd/Kings Head Hill/Lea Valley Rd junction. Increase tree cover, provision of wildlife friendly planting and seating away from the roadside. Provide visitor information/map board showing recreational routes/open spaces/transport hubs.</li> <li>• Provide better access to Sewardstone Paddock and access into the Lee Valley. Raised table/pedestrian crossing nearby Hawkwood Crescent. Street tree planting adjacent to Sewardstone Road north of King Hill Junction.</li> <li>• Provide better legibility from the gateway area to Mansfield Park with provision of signage and increased street trees.</li> <li>• Improvement programme at Mansfield Park, including entrance improvements at Mansfield Hill and Valley Side.</li> </ul> | <ul style="list-style-type: none"> <li>• The ecological features of nearby Epping Forest SAC are under increased pressure from recreation.</li> <li>• Waltham Forest Open Space Study Strategy Action 15.</li> </ul>   | London Borough of Enfield  |   |                          |
| <b>I. North Chingford Gateway to the Forest</b> | <p>Develop the area around Chingford Station as a key gateway to Epping Forest to reduce car journeys to the site and promote sustainable travel to the Forest. Access to the Forest via the visitor provides the opportunity to engage residents in responsible and appropriate use of the site and increased awareness of the sensitive SAC habitats. Improve legibility around the station to promote access to other open spaces in the borough and non-SAC land. Summary of interventions:</p> <ul style="list-style-type: none"> <li>• Improve the character of the area around Chingford station with highway/streetscape improvements with seating, cycle parking and signage. Increase street tree cover and planting.</li> <li>• Intermittent / light segregation for cyclists along Station Road between Chingford Station and Chingford Plain. Traffic calming measures along ranger's road and provision of crossing points for cyclists and pedestrians to access visitor centre and other facilities.</li> </ul>  | <ul style="list-style-type: none"> <li>• Ecological features of Epping Forest SAC are being negatively affected by poor air quality and recreational pressure.</li> <li>• There are pockets of deficiency in access to open space nearby Chingford Station.</li> <li>• There are barriers to access / Connectivity along the railway line and busy roads.</li> </ul> | <p>Transport for London</p> <p>City of London Corporation</p> <p>Parks Friends Groups, e.g. Pimp Hall.</p> | <p>Access and Connectivity</p> <p>Biodiversity and Conservation</p> | <p><b>£1 million</b></p> |

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|                                    | <ul style="list-style-type: none"> <li>• Signage/board map and interpretation at Chingford Station indicating location and routes to other open spaces such as Pimp Hall Park and Nature Reserve.</li> <li>• Engagement with cycle hire outlet at Chingford Hub and City of London to identify opportunities help promote active recreation and sustainable travel from this location.</li> </ul>  |   |   |  |                          |
| <b>J. Whipps Cross development</b> | <p>Landscape led development of Whipps Cross Hospital site. The site has been identified as a key opportunity area for flood detention as it lies along a major route for surface water runoff. The development must also improve public realm, permeability and legibility to and from the site to Wood Street, Bakers Arms and Leytonstone. The site is adjacent to an identified visitor 'hotspot' at Epping Forest SAC; Leyton Flats. The development of the site provides the opportunity to enhance existing woodland and open space within the area of change to provide high quality green infrastructure, access to nature and alternative recreational space for some users of Epping Forest.</p> <p>Summary of interventions:</p> <ul style="list-style-type: none"> <li>• Ensure layout/configuration of the development protects an area along the south/west boundary along Peterborough Road to accommodate flood storage/mitigation. Design of flood storage/mitigation to ensure maximum benefit for biodiversity and access for recreation for health and wellbeing. Continue engagement with Leyton Sixth Form College to scope out feasibility of delivering a complementary scheme that also provides educational benefits. Ensure appropriate consideration of the drainage hierarchy as part of site design and ensure appropriate incorporation of green roofs, walls, permeable features and other urban greening.</li> <li>• Retain and enhance woodland areas on site and woodland to the east to provide alternative open space provision for some users of Epping Forest. To include entrance improvements, branding, access improvements, bins/benches.</li> <li>• Improve the south side of Whipps Cross Road for pedestrians and cycling. Improve road safety and provide</li> </ul> | <ul style="list-style-type: none"> <li>• The site is included with Whipps Cross Strategic Location.</li> <li>• Adjacent properties are at risk from surface water flooding events.</li> <li>• There is a deficiency in access to open space to the west of the site.</li> <li>• The site is adjacent to Leyton Flats, which has been identified as a visitor hotspot at Epping Forest SAC and is under considerable recreational pressure.</li> </ul> | <p>NHS</p> <p>Natural England</p> <p>Environment Agency</p> | <p>Access and Connectivity</p> <p>Biodiversity and Conservation</p> <p>Blue Infrastructure</p> <p>Open Space</p> <p>Urban Greening</p> | <p><b>£2 million</b></p> |

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|  | <p>crossings at the northern and eastern boundary along Whipps Cross Road and James Lane to facilitate access to surrounding open space/woodland.</p> <ul style="list-style-type: none"> <li>• Ensure an appropriate wayfinding strategy is included as part of site proposals to ensure good connectivity/legibility for all users to local amenities and local links for sustainable travel (e.g. Wood St for Wood Street Station, Mini-Holland Network at High Street Leyton). Develop marked cycleway to accessible footbridge at A12 to promote sustainable travel to Leytonstone Station via Colworth Road.</li> <li>• Environmental enhancements to bridge crossing at east side of A12 to include tree planting.</li> </ul>  |  |  |   |                     |
| <b>K. Urban greening opportunities along A12</b> | <p>Leytonstone, Grove Green, Cathall and Cann Hall wards at the very south of the borough are deficient in publicly accessible open space. This is compounded by pollution caused by the A12 which runs through the centre of these four wards. In addition, links between transport hubs could be improved for cyclists and pedestrians, in particular between Leytonstone High Road and Maryland station to the south. Crossrail 1 will run just south of the Waltham Forest boundary, within the borough of Newham. Improved pedestrian and cyclist links should also be explored in the south of the borough to take advantage of these strategic transport links. Summary of interventions:</p> <ul style="list-style-type: none"> <li>• Identify opportunities for urban greening through commissioning a detailed GI study; street tree and ornamental planting across the southern wards will help combat deficiency in green space, reduce air pollution and encourage sustainable transport. Particular opportunities include: a green link along Cann Hall Road / Crownfield Road to link the Olympic Park and Wanstead Heath; introducing traffic calming measures such as modal filters/ greening at existing modal filters.</li> <li>• Support local community groups to undertake community-led de-paving projects.</li> <li>• Create a segregated cycle lane between Leytonstone High Road and Maryland station in the south.</li> </ul> | <ul style="list-style-type: none"> <li>• There is a deficiency in open space across these wards</li> <li>• Poor air quality as a result of the A12 crossing the south of the borough has an impact on living environment.</li> <li>• Improved links to transport hubs in most deprived areas, in particular to Crossrail 1.</li> <li>• Climate change resilience – creating habitat stepping-stones across the south of the borough.</li> <li>• Helping to deliver pollinator strategy.</li> <li>• Community engagement</li> </ul> | <p>London Borough of Newham<br/>Community groups</p> <p>Transport for London</p> <p>Groundwork</p> <p>Greater London Authority</p> | <p>Access and Connectivity</p> <p>Biodiversity and Conservation</p> <p>Open Space</p> <p>Urban Greening</p> | <b>£2.5 million</b> |
| <b>Total: £24,000,000</b>                        |  |  |  |   |                     |

## Green & Blue Infrastructure Principles

The Draft Green & Blue Infrastructure Study recommends the following principle be adopted:

- Deliver high quality, multifunctional and publicly accessible open space recognising its potential to improve the health and well-being of local communities through providing a range of opportunities for recreation, sport and play.
- New development will be required to consider the location and layout of open space, play space and areas for recreation early in the design process, and may be required to provide additional open space or contributions towards improvements to existing open space. Proposals which employ principles of 'good design' that ensure open spaces are welcoming and safe, with good natural surveillance will be supported.
- Enhancement of the wider network will be promoted to mitigate against poor provision by; creating new open spaces; ensuring well designed, high quality public realm and civic spaces are incorporated; creating good links, accessible green corridors and routes between existing open spaces; addressing barriers to access; and ensuring other green and blue infrastructure features, such as flood storage and habitat areas are incorporated within open spaces to provide opportunities for informal recreation, sport and play.
- Ensure open spaces maximise health and well-being benefits, through providing inclusive, playable spaces for all; including areas for natural play, informal play, as well as equipped play spaces within open space.
- On-going management will ensure that strategically important open spaces such as the borough's Premier Parks, Walthamstow Wetlands, and sites in areas with open space deficiencies are resilient to any potential increased visitor or population pressure. This includes the provision of appropriate levels of facilities, sports pitches, infrastructure and resilient planting.
- Improvements to existing open spaces within the vicinity of Epping Forest SAC and Lee Valley SPA, as well as the inclusion of additional open space within new developments, will be recognised as a key aspect of reducing recreational pressure through the undertaking of a borough-wide SANGs review.

Source: *Waltham Forest Green & Blue Infrastructure Study, 2020*

# 24. Epping Forest SAC

- 24.1 Waltham Forest is within the 'zone of influence' for Epping Forest Special Area of Conservation (SAC). The council therefore has duties as a competent authority under the provision of the Habitats and Species Regulations 2017 and must ensure that planning decisions do not result in adverse effects to SAC.
- 24.2 The Epping Forest Mitigation Strategy is currently in development, and once finalised will comprise a package of mitigation measures to address negative impacts on the site. A key driver of the strategy is recognition of the likely significant effect that residential development will have on the SAC through increased recreational pressure.
- 24.3 Epping Forest SAC and Lee Valley SPA/Ramsar sites are European designated sites. A Draft Habitats Regulations Assessment (HRA) for Waltham Forest has been produced which assesses the potential effects of recreational pressure, water pollution, water demand, air pollution and urbanisation which the Draft Local Plan's policies may impose on the SAC and SPA/Ramsar site. Waltham Forest's Draft Local Plan facilitates population growth, as well as creating changes to infrastructure routes. Therefore, the HRA found that potential adverse effects in relation to recreational pressure were identified for Epping Forest SAC and that potential adverse urbanisation effects could occur on the SAC and SPA/Ramsar sites.
- 24.4 Possible adverse recreation effects include:
- Trampling by walkers and cyclists leading to soil erosion and compaction;
  - Damage to veteran trees from climbing and trampling of their roots;
  - Eutrophication from dog fouling;
  - Challenges to grazing practices due to interactions between livestock and visitors;
  - Damage to saplings causing issues with the tree stock;
  - Harvesting by visitors;
  - Disturbance to wildlife, including invertebrates such as the Stag Beetle for which the SAC is designated; and
  - Disturbance to bird species for which the SPA/Ramsar site is designated.
- 24.5 There is a requirement for Local Authorities within the Zone of Influence (ZOI) of a European designated site to provide Suitable Alternative Natural Green Spaces (SANGs), with an aim to reduce visitor and recreational pressure on these ecologically sensitive areas. Visitor surveys undertaken in 2019 suggest the Recreational ZOI for Epping Forest extends to 6.7km, covering the entirety of Waltham Forest. This buffer relates to Natural England's guidance of the distance in which 75% of Epping Forest's visitors have come from within (6.67km). The Inner Recreational ZOI is considered to be 3km.

- 24.6 The HRA and Natural England recommend the undertaking of an Epping Forest SANG Strategy which would need to be agreed before the Local Plan is adopted. This could either be specific to the London Borough of Waltham Forest or strategic by working in partnership with other authorities within the ZOI.
- 24.7 The Epping Forest SANG Strategy should include:
- The location of suitable SANGs either within the borough or within the surrounding area if creating an all-encompassing strategy;
  - The number of dwellings which each SANG will provide mitigation for;
  - Which existing green spaces within the borough will be enhanced to provide additional visitor capacity, including details on how this will be achieved. This could include increasing carrying capacity or through making improvements to existing footpath networks to enhance connectivity to local green spaces; and
  - The funding mechanism for the creation and future management of the SANGs.
- 24.8 Natural England guidance states that a minimum of 8ha of SANGs should be provided for every 1,000 head of population increase. This is difficult to achieve within Waltham Forest as an urban London borough, especially as a SANG cannot be used for more than one designated site, in this case Epping Forest SAC and Lee Valley SPA/Ramsar site. Therefore, it is advised that a further study is carried out to determine a strategy for delivering SANGs within the borough. This will primarily focus on how existing green spaces and networks can be improved to enhance their visitor capacity, as well as working with neighbouring authorities to identify SANGs elsewhere.
- 24.9 Waltham Forest will help to deliver the mitigation strategy in cooperation with surrounding authorities and will most likely be funded through developer contributions. Policy 83 of the Draft Local Plan sets out the Council's position with regard to the Epping Forest SAC.