

Thurrock Green and Blue Infrastructure Strategy

2022/23 Update

Thurrock Council

Final report

Prepared by LUC

February 2023



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Chapter 1

Introduction

1.1 This Green and Blue Infrastructure (GBI) Strategy report describes existing GBI in Thurrock and sets out priorities for the provision of new and improved GBI in the borough. The strategy was first drafted in 2019 but unpublished; this report brings the work up to date.

1.2 It is now widely accepted that GBI is critical to support growth, whilst also helping to address the climate and biodiversity crises. The Strategy and the evidence underpinning it will inform infrastructure planning and local plan policy in Thurrock by identifying ways in which existing GBI assets can be protected and enhanced, and how new GBI can be delivered alongside other types of growth-supporting infrastructure. Thurrock covers 165 sq km and has a diverse range of land uses and associated environmental issues. More than half of the land in Thurrock is designated Green Belt and the Borough has around 30km of Thames riverfront. Thurrock has been a focus of major growth in recent years, due to the availability of large areas of former industrial land for redevelopment, its proximity to London and its good transport links. This is expected to continue, and the emerging Local Plan will identify growth areas towards which development will be focussed. The borough is also a place in which significant investment in infrastructure is proposed, including the proposed Lower Thames Crossing, a new road linking Kent and Essex.

1.3 New development has the potential to put pressure on existing GBI but also provides an opportunity to deliver new GBI. This GBI Strategy will help to direct investment in GBI within Thurrock, to where it can achieve the most benefit for the borough's residents and environment.

1.4 This introduction provides an overview of what GBI is and what its benefits are. The remainder of the report is structured as follows:

- Chapter 2 outlines the approach that is being taken to develop the Strategy.

- Chapter 3 outlines the key drivers for GBI specific to Thurrock.
- Chapter 4 defines and analyses existing GBI assets and identifies key issues and opportunities for GBI relating to these.
- Chapter 5 sets out the vision and objectives for the GBI Strategy.
- Chapter 6 sets out the implications of changes to the GBI baseline and context for the development of the GBI Strategy, and the next steps that will be taken.
- Appendix A provides a list of data used.
- Appendix B summarises relevant planning policy and guidance.
- Appendix C contains the sections of the 2019 draft GBI Strategy that will be updated at the next stage of this work.
- Appendix D provides an initial review of the 2019 proposals, against the changes identified in this report.

1.5 This report presents the updated strategy as of January 2023. As the Local Plan and designs for significant development within the Borough progress, the GBI proposals within this Strategy will be refined and developed further by the Council.

What is green and blue infrastructure?

1.6 Green infrastructure is a network of green spaces and features. The term is sometimes expanded to "multifunctional" green infrastructure, referring to the integration and interaction of different functions or activities on the same piece of land (see **Figure 1.1**). Blue infrastructure refers to rivers, canals, other open water, sustainable drainage, harbours and the coastline. GBI can be in public or private ownership and be of any size or condition.

1.1 The National Planning Policy Framework [\[See reference 1\]](#) defines Green Infrastructure as:

“A network of multi-functional green and blue spaces and other natural features, urban and rural, which is capable of delivering a wide range of environmental, economic, health and wellbeing benefits for nature, climate, local and wider communities and prosperity.”

1.2 The multifunctional nature of GBI refers to the wide range of environmental, economic and social benefits it can provide, form part of the rationale for the delivery of new and enhanced GBI in Thurrock. These includes improving health and wellbeing, climate change mitigation and adaptation, enhancing landscape, heritage and sense of place, as well as improving biodiversity. These benefits are illustrated on **Figure 1.2** and are summarised in Natural England’s Green Infrastructure Principles [\[See reference 2\]](#) as:

- Nature rich beautiful places;
- Active and healthy places;
- Thriving and prosperous places;
- Improved water management; and
- Resilient and climate positive places.

1.3 Further information on Thurrock’s GBI network and the benefits that it brings is set out in Chapter 4.

Figure 1.1: Components of GBI

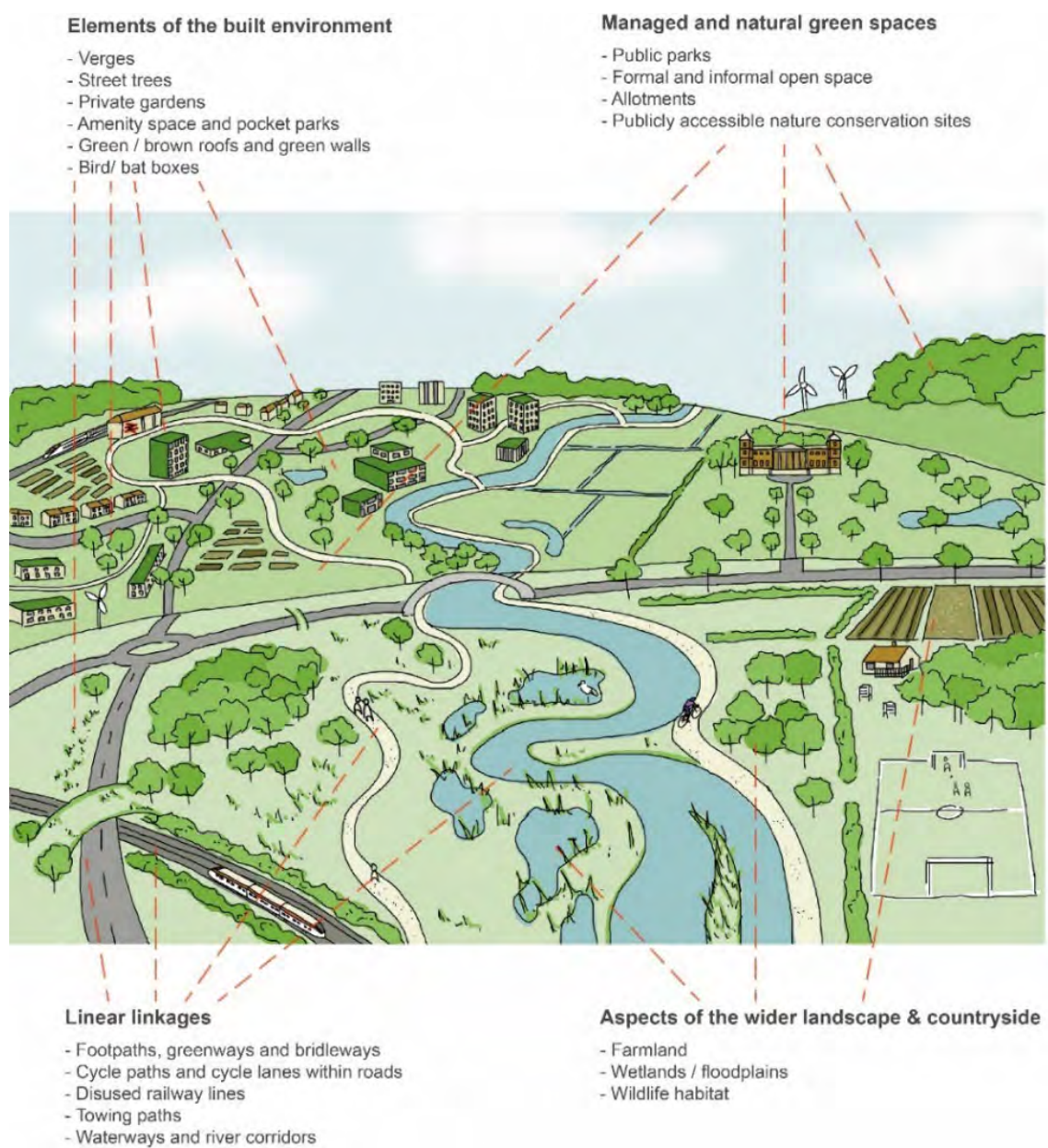


Figure 1.2: Benefits of GBI



Chapter 2

Approach to Strategy

2.1 This chapter sets out how the GBI Strategy has been prepared.

2.2 This report updates the draft GBI Strategy prepared in 2019, which involved four broad stages:

- Establish GBI baseline;
- Development of vision, objectives and initial GBI proposals;
- Consultation and refinement of proposals; and
- Reporting.

2.3 For this update, the draft work is being revisited in two stages. Stage 1 involved the following tasks:

- Update baseline information and context to take into account changes since 2019;
- Consider the broad implications of those changes for the vision, objectives and proposals identified in the 2019 draft GBI Strategy; and
- Make recommendations for embedding GBI within the emerging Local Plan (the draft Local Plan that will be published for 'Regulation 18' consultation).

2.4 Stage 2 of the GBI Strategy update involved the following tasks:

- Stakeholder consultation workshop to present the work so far and to identify and refine GBI proposals.
- Update the baseline and context, based on consultation and any additional evidence available at that time.

- Development of strategic GBI proposals; updating and adding to those identified in the 2019 work.
- Production of final report.

2.5 This report presents the findings of both the Stage 1 and Stage 2 work, as an update to the 2019 report. Chapters 1-5 and 8 (and related appendices) have been updated as part of the Stage 1 work. At Stage 2, Chapters 6-8 have been updated, along with any changes necessary to earlier chapters, in light of new information.

2.6 A summary of the key elements of these tasks is provided below.

Establishing and updating the GBI baseline

2.7 Understanding Thurrock's GBI network and the context in which it exists has involved a review of the latest national policy and guidance, desk-based analysis of mapped data for different GBI assets, and review of relevant evidence and strategy documents. The mapping has been produced using a Geographical Information System (GIS) and the data used is listed in **Appendix A**. Documents that have informed the Strategy are listed in the **References** section.

2.8 When considering the GBI network, it has been useful to group together types of features, to help with presenting a large volume of information. These have been grouped as follows: landscape, historic environment, biodiversity, open space, active transport, blue infrastructure, and cross-boundary GBI. It should be noted, however, that there is overlap between these categories and some issues (e.g. health and climate change) cut across multiple categories.

2.9 The findings of this task are presented in the review and identification of key drivers for GBI in Thurrock (**Chapter 3**) and as key issues and opportunities relating to each of the types of GBI assets (**Chapter 4**) .

Developing the vision and objectives and defining the need for strategic GBI

2.10 In light of the evidence gathered on the GBI baseline and context, an overarching vision and set of objectives were drafted. These form the basis from which the GBI proposals that comprise the Strategy were developed (**Chapter 5**).

2.11 The identification of strategic projects (in the 2019 draft GBI Strategy) was based on site visits, the evidence gathered through the review of baseline information, and stakeholder consultation. The proposed projects were chosen for their capacity to address the issues and opportunities identified in the baseline review and to deliver upon the vision and objectives.

Consultation

2.12 As part of the draft GBI Strategy work in 2018/19, LUC undertook two rounds of stakeholder engagement in order to refine the vision, objectives and strategic GBI projects. A summary of the outcome of that consultation is provided in **Appendix C**.

Identification of GBI projects

2.13 The Stage 1 work collated information on GBI assets in Thurrock and changes and pressures driving the need for improvements to the GBI network.

This produced the following, which have informed the identification of GBI projects:

1. Mapping to visualise the current GBI network.
2. Issues, opportunities and needs associated with different types of GBI asset.
3. Draft Vision and Objectives for GBI enhancement.
4. Consultation with local stakeholder organisations to identify further issues, opportunities and needs.
5. Refinement of the Vision and Objectives, against which GBI projects will be considered.

2.14 Building upon the baseline study and consultation, the following have been undertaken to refine and prioritise GBI projects (Chapter 6):

6. Grouping of needs/opportunities into strategic areas of focus and projects, where similar needs and opportunities occur.
7. Working up of projects to identify key stakeholders, methods of implementation etc.
8. Prioritising of projects against Vision and Objectives.

Recommendations for planning policy and GBI delivery

2.15 Recommendations for the Regulation 18 draft Local Plan were made at Stage 1 based on best practice guidance on embedding GBI policies within a

Plan. More detailed recommendations have been developed (Chapter 7), following identification of the proposed projects.

Chapter 3

Drivers for GBI in Thurrock

3.1 This chapter summarises key drivers for GBI in Thurrock within the forthcoming Local Plan period (to 2040). Relevant planning policy, which also drives the requirement for GBI, is summarised in **Appendix B**.

Climate change

3.2 Climate change poses significant risks to people and the environment, including:

- Extended period of dryness and heat in the summer, leading to drought and increased demand for cooling;
- Heightened flood risk due to more intensive and prolonged rainfall, particularly in winter months; and
- Sea level rise and changes in wave patterns and strength, which may result in increased erosion of coastal areas.

3.3 Such effects may have significant socio-economic and health implications. Low income and other disadvantaged groups are generally at greater risk from the negative effects of climate change **[See reference 3]**.

3.4 The Intergovernmental Panel on Climate Change (IPCC) special report on global warming **[See reference 4]** outlines that, under emissions in line with current pledges under the Paris Agreement, global warming is expected to surpass 1.5°C, even if these pledges are supplemented with very challenging increases in the scale and ambition of mitigation after 2030. This increased action would need to achieve net zero CO₂ emissions in less than 15 years.

3.5 In light of the IPCC work, Thurrock Council declared a Climate Emergency in October 2019. With this, the Council has committed to reduce its net CO₂ emissions to zero by 2030. A Climate Change Partnership Group has now been established in Thurrock. This group is tasked with determining how and when the Council can achieve net zero carbon emissions, as well as how to best leverage the benefits of climate action for other socio-economic goals, leading to the development of targets, pathways, and an action plan for Thurrock to reduce its greenhouse gas emissions in line with the UK's net zero goal.

3.6 Work by Manchester University's Tyndall Centre for Climate Change Research identifies specific targets for Thurrock [\[See reference 5\]](#), based UK's Paris Agreement commitments:

- The Borough should stay within a maximum cumulative carbon dioxide emissions budget of 5.5 million tonnes (MtCO₂) for the period of 2020 to 2100. It should be noted that at 2017 carbon dioxide emission levels, Thurrock would use this entire budget within seven years from 2020.
- The Borough should also initiate an immediate programme of carbon dioxide mitigation to deliver cuts in emissions averaging a minimum of -12.9% per year to secure a Paris aligned carbon budget.
- The Borough should reach zero or near zero carbon no later than 2042.

3.7 Thurrock's emissions of CO₂ have fallen in recent years (a reduction of 58% between 2005 and 2019), largely as a result of the closure of heavy industry and transition towards a service-based economy [\[See reference 6\]](#). Thurrock's per capita emissions remain similar to regional and national averages. In 2019, Thurrock's carbon emissions were approximately 5.3 tonnes per capita, whereas emissions for the East of England as a whole were 5.4 tonnes per capita and for the UK were 5.5 tonnes per capita [\[See reference 7\]](#). Over 45% of Thurrock's greenhouse gas emissions are from transport, with around 22% emissions from domestic sources and around just under 15% from industry. 2005 to 2019, Thurrock's carbon emissions from industry have fallen by over 74%, whereas emissions from transport have only fallen by around 7% [\[See reference 8\]](#). Thurrock's high transport emissions are likely to be linked both to the Borough's proximity to London, and associated high levels of out-

commuting, as well as to the concentration of logistics businesses in the Borough.

3.8 Analysis of 2011 census data (the latest census data available on travel, at the time of writing) reveals that 40% of Thurrock's resident population travel to work by driving a car or van. This compares to 14% who travel by public transport [\[See reference 9\]](#). Of a total of 64,202 journeys to work recorded in the 2011 census for Thurrock, 32% were less than 5km yet walking and cycling accounted for only 5% of all journeys [\[See reference 10\]](#).

3.9 The Thurrock Strategic Flood Risk Assessment notes that climate change is anticipated to have an impact on all sources of flood risk. The River Thames Tidal Defences provide protection from up to a 1 in 1000 year (0.1% AEP) flood event along the Thames frontage, with the standard of defence reducing down to sections of 1 in 20 year (5% AEP) in the more rural, upper reaches of the Mardyke. [\[See reference 11\]](#)

3.10 There are approximately 11,000 properties at risk of tidal flooding in Thurrock and several hundred properties at risk of fluvial flooding. Locations at the highest risk are Tilbury, East Tilbury, Fobbing, London Gateway, Purfleet, West Thurrock and Bulphan. This risk is likely to increase as a result of climate change. The main sources of tidal and fluvial flooding in Thurrock are the Thames and the Mardyke [\[See reference 12\]](#). In addition, many of the marsh areas are low lying and very vulnerable to flooding [\[See reference 13\]](#).

3.11 The potential for climate change to result in more intense rainfall during the summer months and wetter winters in the UK is also likely to affect the area's water quality. This is because surface water runoff from urban areas can increase water pollution and cause sewer overflows after heavy rain. Agricultural practices can also lead to water pollution through nutrient enrichment. GBI including sustainable drainage measures can manage water runoff and reduce pollution impacts.

3.12 The Thames River Basin Management Plan [\[See reference 14\]](#) and the South Essex Catchment Plan [\[See reference 15\]](#) set out priorities for the

Mardyke and Thames catchments that include flood management using natural processes and climate change adaptation. Further information on these plans is set out in the 'blue infrastructure' section of **Chapter 4**.

3.13 Climate changes will include droughts and hotter summers. Although this will affect rural areas (e.g. increased need for irrigation of agricultural land), it will be exacerbated in urban areas by the urban 'heat island effect' and by poor air movement caused by buildings and topography (e.g. in former minerals extraction sites).

How GBI can address climate change [\[See reference 16\]](#), [\[See reference 17\]](#)

- GBI plays a key role in mitigating and adapting to climate change.
- GBI can help to reduce greenhouse gas emissions from transport, by promoting sustainable modes of transport, particularly walking and cycling, as an alternative to use of cars and other motorised vehicles.
- Trees and other vegetation remove airborne pollutants, making the air cleaner.
- GBI in urban areas has an important role to play in ameliorating the warming effects of climate change and the urban heat island effect. Provision of GBI can reduce higher urban temperatures through evapotranspiration and direct shading.
- GBI in the form of vegetation and sustainable drainage systems can contribute to flood alleviation by slowing flows and reducing the volume of runoff through interception, infiltration and attenuation. This will also help enhance the ecological status of the area's watercourses through the filtering of pollutants

Biodiversity loss

3.14 Biodiversity, defined as the variety of plant and animal life, is under threat across the world. The most significant threat to biodiversity is the loss of habitat and habitat fragmentation through urbanisation, agriculture and climate change. In the UK, legislation protecting biodiversity has recently been strengthened with the Environment Act 2021 passed into law in November 2021. The Act is an important step towards realising the Government's 25 Year Environment Plan and legislates for (among other things) a halt in species decline by 2030 and mandatory Biodiversity Net Gain (BNG) of 10% from new developments.

3.15 BNG is “an approach to development that leaves biodiversity in a better state than before”. In addition to minimising loss of biodiversity through the mitigation hierarchy, BNG should support restoration of ecological networks.

3.16 The report of the Lawton Review for Defra, titled 'Making Space for Nature' [See reference 18] sets out what needs to be done to enhance ecological networks; summarised as:

- **More:** Creating new patches of habitat and natural green space will facilitate the colonisation of more species, as well as allowing enhanced access to nature for nearby residents.
- **Bigger:** Existing habitat areas can be increased in size through the GBI network, either through the creation of additional habitat or using green and blue features to act as a buffer to core habitat areas. It is essential to analyse the potential of the strategic GBI network to identify where habitat can be expanded onto nearby sites.
- **Quality:** Improvements to existing core habitat areas (such as designated wildlife sites) can be focussed where there will be the most benefit. Where low quality sites exist, for example patches of amenity grass, upgrades in quality can provide pockets of habitat refuge within urban locations.
- **Connected:** The provision of blue and green corridors is essential in creating a resilient network to both climate change and anthropogenic pressures. Better connections between areas of habitat allows species to

colonise new microhabitats and microclimates, therefore allowing for enhanced climate resilience. Gaps in the network can be strengthened through the provision of urban greening, for example tree-lined streets, green roofs and pockets parks which create 'stepping stones' for biodiversity

3.17 These principles underpin emerging Local Nature Recovery Strategies (LNRS). Identified within the Environment Act 2021, LNRS form the delivery mechanism for a national Nature Recovery Network. This framework for nature recovery is intended to allow 'joined-up thinking' in monitoring and reporting on biodiversity, and in the planning and delivery of conservation actions. It is intended that this GBI Strategy will provide a foundation on which measures suitable for Thurrock can be identified and incorporated into the Essex LNRS.

3.18 The development of brownfield land, which is given preference in national policy, could affect sites in Thurrock that are important for invertebrates (see 'Development of brownfield land', below). Locally, increased protection is already being considered for brownfield development sites that are important for invertebrates, as part of Natural England's designation programme [\[See reference 19\]](#). The Swanscombe Peninsula SSSI (in Kent) was designated in 2021 as part of this review. It is not yet known whether further sites in Thurrock will be designated, but other important locations for invertebrates, that are not part of SSSIs, include sites around Tilbury Power Station and Chafford Gorges.

How GBI can address wildlife and habitats

- Investment in GBI provides a means of conserving and enhancing habitats with benefits for biodiversity by [\[See reference 20\]](#):
- Increasing habitat area - as the area of habitat increases, both the population size of individual species and the species richness of an area increase. This improves the resilience of habitats and species to change.

- Increasing populations of protected and valued species – many areas of green space and brownfield land in Thurrock contain protected or valued species; GBI can assist in increasing such populations.
- Increasing species movement – GBI creates opportunities for long-distance movement for some species by providing green and blue corridors.

Health and wellbeing

3.19 In the 2019 Indices of Multiple Deprivation, Thurrock ranked 116 out of 317 local authorities in England (1 being the most deprived) in terms of overall deprivation [\[See reference 21\]](#). Deprivation varies across the area, with four Lower Super Output Areas (LSOAs) within the 10% most deprived neighbourhoods in the country.

Figure 3.1: Indices of Multiple Deprivation - all indices

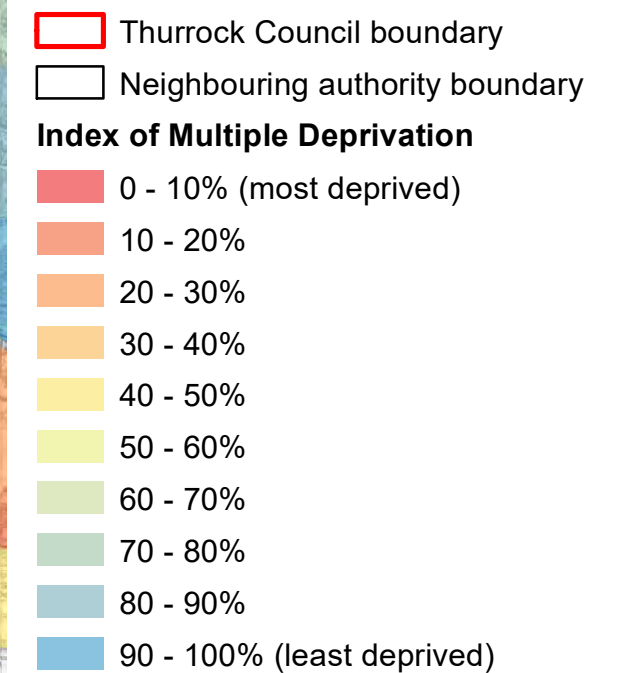
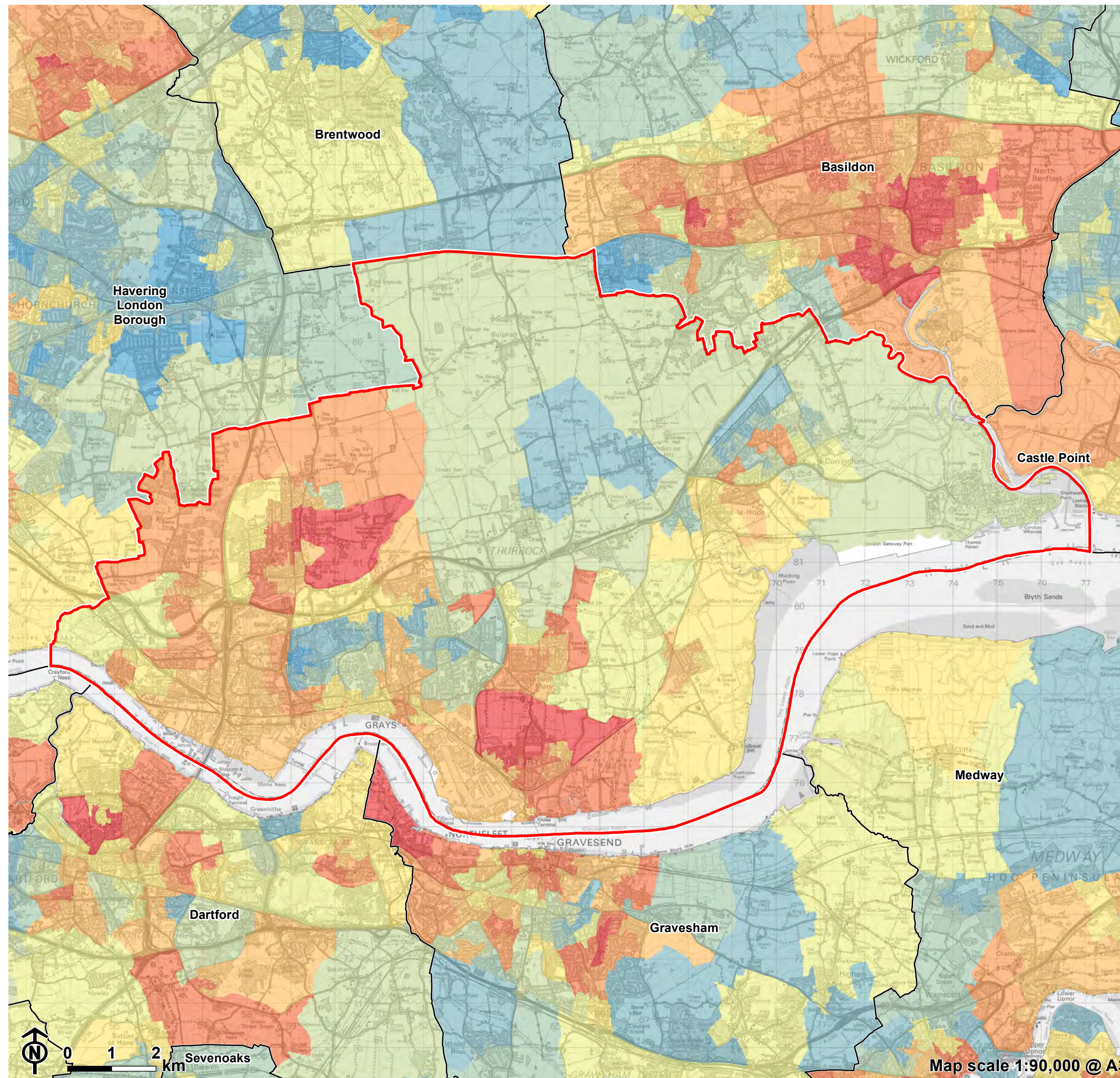
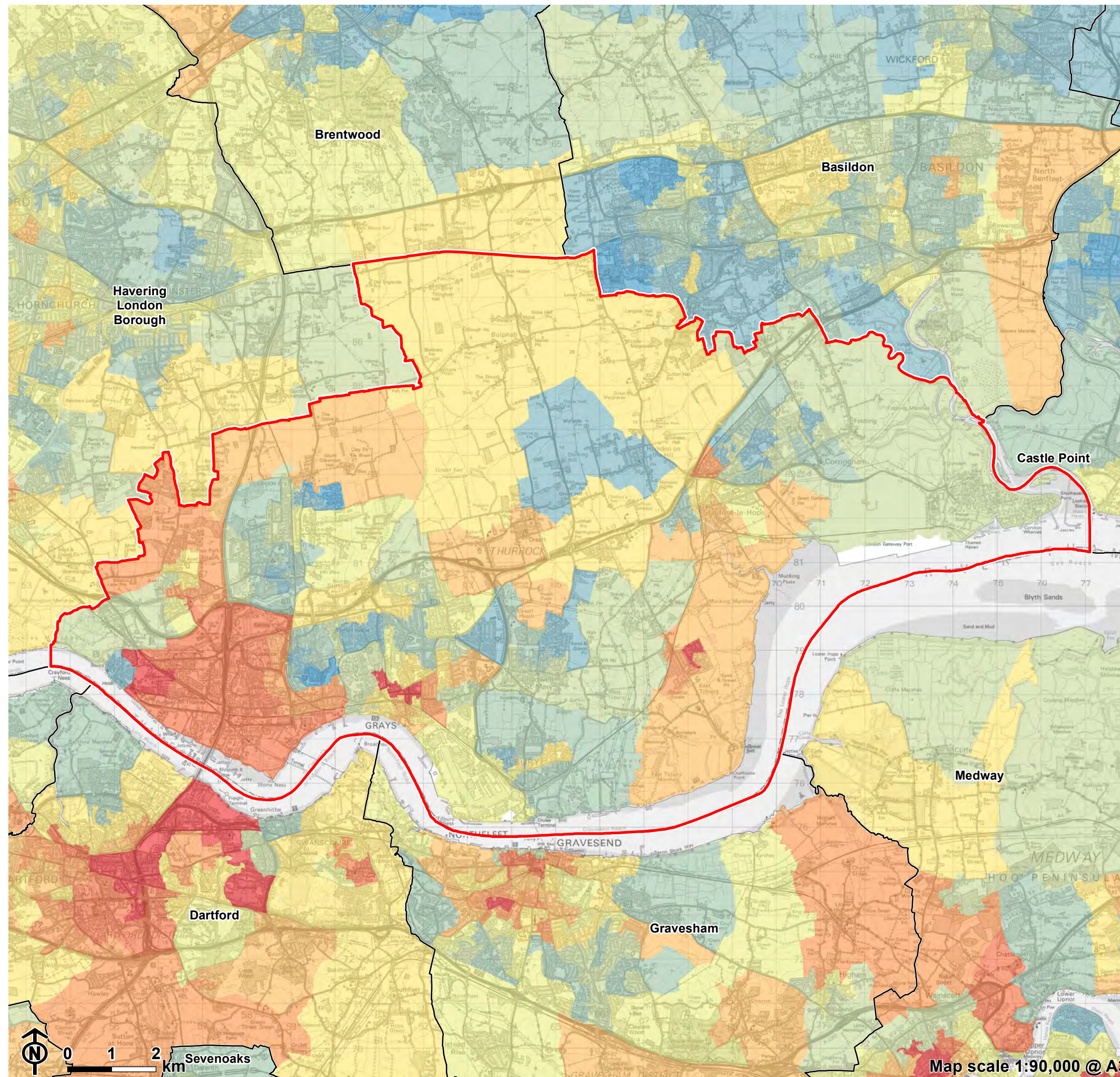
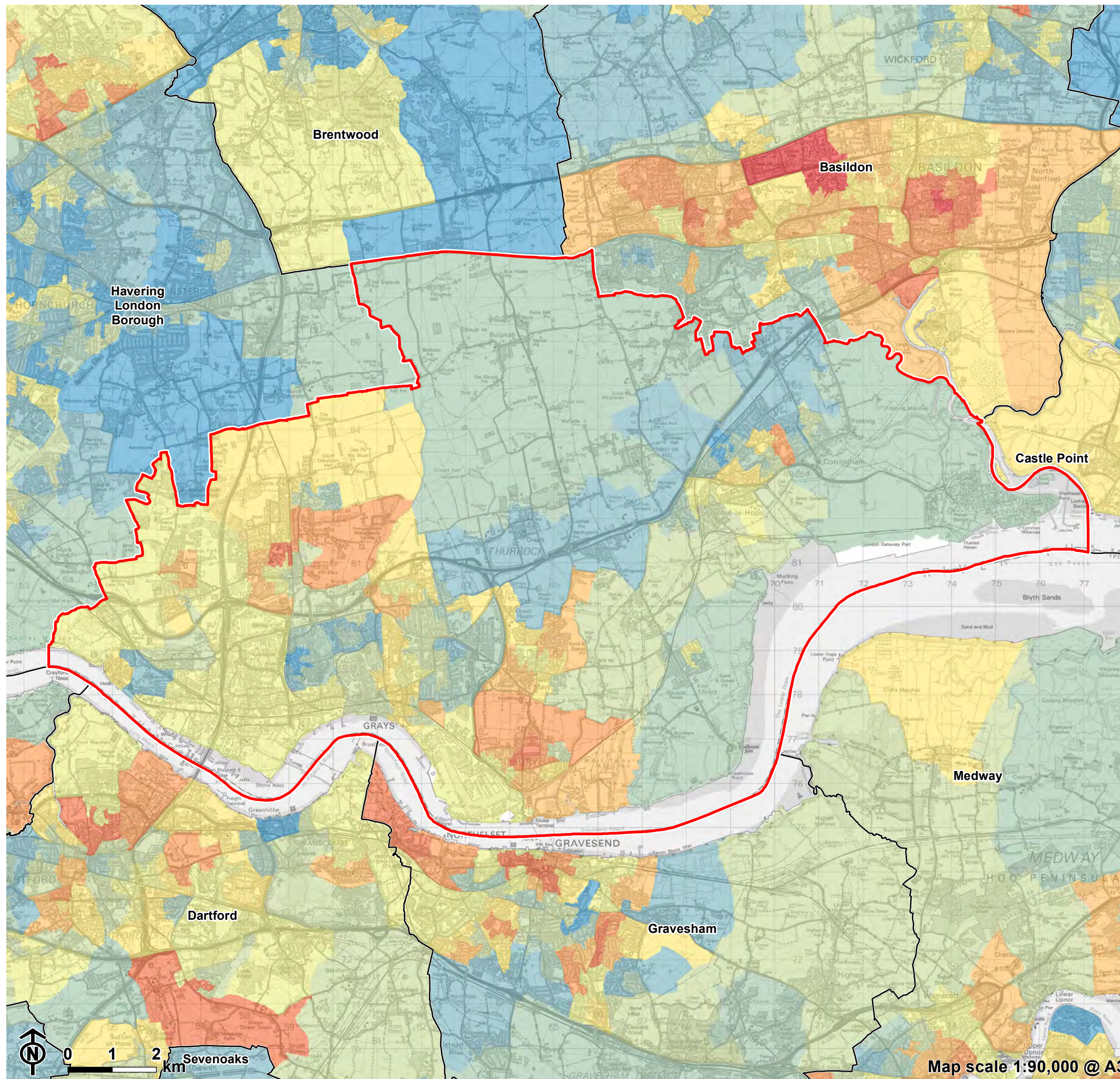


Figure 3.2: Indices of Multiple Deprivation - living environment



- Thurrock Council boundary
- Neighbouring authority boundary
- Index of Multiple Deprivation**
- Living Environment**
- 0 - 10% (most deprived)
- 10 - 20%
- 20 - 30%
- 30 - 40%
- 40 - 50%
- 50 - 60%
- 60 - 70%
- 70 - 80%
- 80 - 90%
- 90 - 100% (least deprived)



**Figure 3.3: Indices of Multiple Deprivation
- health deprivation and disability**

- Thurrock Council boundary
- Neighbouring authority boundary
- Index of Multiple Deprivation**
- Health Deprivation and Disability**
- 0 - 10% (most deprived)
- 10 - 20%
- 20 - 30%
- 30 - 40%
- 40 - 50%
- 50 - 60%
- 60 - 70%
- 70 - 80%
- 80 - 90%
- 90 - 100% (least deprived)

3.20 Figure 3.1, Figure 3.2 and Figure 3.3 show different data from the Index of Multiple Deprivation: overall IMD, living environment and health and disability deprivation. These illustrate that there are significant differences in the level of deprivation across Thurrock. In terms of overall deprivation, the majority of the Borough falls in the top 50% most deprived. However, there are areas with significantly higher levels of deprivation (0-20% most deprived), notably the urban areas including in parts of South Ockendon, Tilbury and Grays. Areas with a higher level of living environment deprivation include parts of Tilbury, Grays and Purfleet. Areas with a higher level of health and disability deprivation include parts of Tilbury and South Ockendon. In 2019, 32.1% of children in the borough were recorded to be in poverty [See reference 22].

3.21 Life expectancy at birth in 2019 in Thurrock was 79.2 years for males and 82.5 years for females, which is 'significantly worse' than the national average of 79.7 years and 83.2 years respectively. The proportion of deaths that are from cancer, circulatory disease, coronary heart disease and respiratory disease are all 'significantly worse' than the England averages. [See reference 23].

3.22 Obesity continues to be a major problem in Thurrock as well as nationally with the Government's 2020 Obesity Strategy identifying tackling obesity as one of the greatest long-term health challenges the country faces. In Thurrock, 22.5% of children in Year 6 are obese, which is greater than the national average of 20.2%. In addition, 69% of adults in Thurrock are classed as overweight or obese, higher than both regional (62.1%) and national (62%) figures. Some 59.5% of adults in Thurrock are physically active, which is less than the national average of 66.3% [See reference 24]. Data based on self-reported measures of wellbeing [See reference 25] indicates that Thurrock has slightly lower levels of satisfaction and happiness, when compared to the regional and national averages. It also has slightly higher levels of anxiety.

3.23 Health and wellbeing is also adversely affected by poor access to services and facilities, including centres of employment, primary and secondary schools, further education institutions, GPs, Hospitals, food stores and town centres.

Average journey times in Thurrock by public transport are less than the England average, suggesting good access to key services (e.g. schools or employment) relative to regional and national averages [\[See reference 26\]](#). However, analysis of 2011 census data reveals that 40% of Thurrock's resident population travel to work by driving a car or van, compared to 14% who travel by public transport. There are also significant barriers to access, including busy roads, rail lines and industrial areas that discourage active modes of travel.

3.24 Air quality is a significant issue in Thurrock, with adverse effects on health and wellbeing. Air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. Thurrock has 67 nurseries, schools and colleges in areas where levels of fine particulate matter (PM2.5) are above the World Health Organisation-recommended limit. [\[See reference 27\]](#) The Borough also currently has 16 Air Quality Management Areas [\[See reference 28\]](#), all of which have been designated for road transport pollutant emissions. Roads, industry and construction work can also contribute to high noise levels.

How GBI can address health and wellbeing

[\[See reference 29\]](#)

- The GBI network can play a key role in supporting improved health outcomes as part of a holistic 'Natural Health Service'
- Enhancing access to and providing green and blue spaces for recreation, near to where people live, can encourage physical activity thereby improving wellbeing and helping to reduce obesity and its related health issues.
- Providing safe, attractive routes to key services and facilities, such as GPs and higher educations can help to encourage the use of those facilities, which in turn encourage positive health outcomes.
- Sustainable transport interventions, such as designated cycle lanes and well-designed highways can help to reduce the risk of traffic accidents and increase road safety.

- Creation of high quality green and blue spaces can help to reduce health inequalities related to income and health deprivation.
- Trees and plants can help to absorb pollutants helping to improve air quality and create a buffer between people and sources of air pollution or noise.
- Creation of walking and cycling routes can improve air quality by reducing car use and associated emissions.

Population, household and economic growth

3.25 The population of Thurrock in the 2021 Census was 176,000, this is an increase of 11.6% from around 157,700 in 2011. This is higher than both the overall increase for the East of England (8.3%) and England (6.6%). [\[See reference 30\]](#) There are 67,200 households in Thurrock [\[See reference 31\]](#).

3.26 The rate of growth of Thurrock's population has exceeded regional and national growth since 1991. By 2043, it is estimated that the population of Thurrock will increase to 205,469, which equates to approximately a 17% increase from the 2020-estimate [\[See reference 32\]](#).

3.27 Thurrock has a higher proportion of people under the age of 65 (86.4%) compared to the national average (81.6%) but less people over the age of 65 at 13.6% compared to the national average of 18.4% [\[See reference 33\]](#).

3.28 There are a number of drivers contributing to population growth [\[See reference 34\]](#). Two key drivers are:

- Rising house and office prices are pushing people out of London, particularly from eastern boroughs such as Newham, Havering and Barking and Dagenham. A significant proportion of Thurrock residents commute out of the Borough for work, with London a particular draw.

Thurrock's proximity to the capital means that it will continue to be an attractive proposition for those who want to live outside of but close to London.

- Employment opportunities in Thurrock, which are concentrated in a few core sectors such as transport and logistics, port functions, and retail. The strength of these sectors reflects two of Thurrock's main economic advantages - its geography and relatively low labour costs. As a whole, Essex's close proximity to both London and Cambridge, and its international airports and ports make it an attractive proposition for inward investment. In addition, Essex is up to 20% cheaper with regards to labour costs for a typical logistics operation compared to London and up to 50% cheaper with regards to labour costs for a typical sales/administration services operation.

3.29 Thurrock's growing population will be accompanied by significant increases in housing and employment space. This household and economic growth will be focused around six key regeneration areas, namely Purfleet, Grays, Lakeside and West Thurrock, Tilbury, London Gateway and Thames Enterprise Park. [\[See reference 35\]](#)

How GBI can address population, household and economic growth [\[See reference 36\]](#)

- Green infrastructure can improve the aesthetic quality of an area, which in turn supports inward investment, attracts businesses and customers, and encourages people to spend more time and money locally.
- Green infrastructure can increase the value of property and therefore make new development more viable. Having well-managed green space nearby results in property value premiums of 2.6% to 11.3%.
- Additional green infrastructure will be needed to meet the needs of a growing population and manage pressures on existing greenspaces.

- Green infrastructure in Thurrock will need to be designed to cater for a wide range of users, taking into account the changing demographic profile.

Nationally Significant Infrastructure Projects (NSIPs)

3.30 The following are proposed in Thurrock. These are in addition to the recently completed Tilbury 2 NSIP (expansion of the Port of Tilbury, at the site of the former Tilbury Power Station). Previous proposals for Tilbury Energy Centre NSIP were withdrawn.

Thurrock Flexible Generation Plant

3.31 Proposals for a gas fired electricity generating station and a battery storage facility were granted development consent in February 2022. The site is located to the north of Tilbury substation.

Lower Thames Crossing (LTC)

3.32 The LTC is a Nationally Significant Infrastructure Project that proposes a new motorway that would link the A13 and M25 in Essex with the A2 and M2 in Kent, via a tunnel under the Thames. The latest proposals [\[See reference 37\]](#) were published in December 2022, following acceptance of the Development Consent Order application for Examination. The LTC includes the following key proposals in Thurrock:

- Tunnel entrance and a new open space (Tilbury Fields), between Tilbury Fort and Coalhouse Fort.

- New junctions with A1013 at Orsett Heath and with M25 at South Ockendon.
- Green bridges and pedestrian / cycling crossings across the new motorway; at Mardyke Valley, the motorway will cross the valley on a viaduct.
- Compensatory planting and large scale ecological mitigation areas for species translocation, including 'HRA wetland mitigation' and 'Coalhouse Fort open mosaic habitat area' close to Coalhouse Fort.
- Upgrading affected rights of way to bridleways and providing additional connections.

3.33 Based on the submitted application, if the application is approved, construction could start in 2025 and the scheme could be operational in 2030.

3.34 The potential impacts of the LTC are far-reaching with potential adverse effects on landscape, cultural heritage, flooding, biodiversity, water quality, and pollution (air, light and noise). The LTC also represents a potential source of funding for GBI in Thurrock, as part of National Highways' Designated Funds Plan [\[See reference 38\]](#). GBI projects funded as part of Designated Funds would be separate to any proposals required for mitigation of the LTC's environmental effects, as they are intended to fund enhancement (e.g. of biodiversity). Stakeholders in Thurrock have identified projects that could be put forward for funding as part of the Designated Funds; these are reflected in the projects identified in **Chapter 6**.

East Anglia Green Energy Enablement (GREEN)

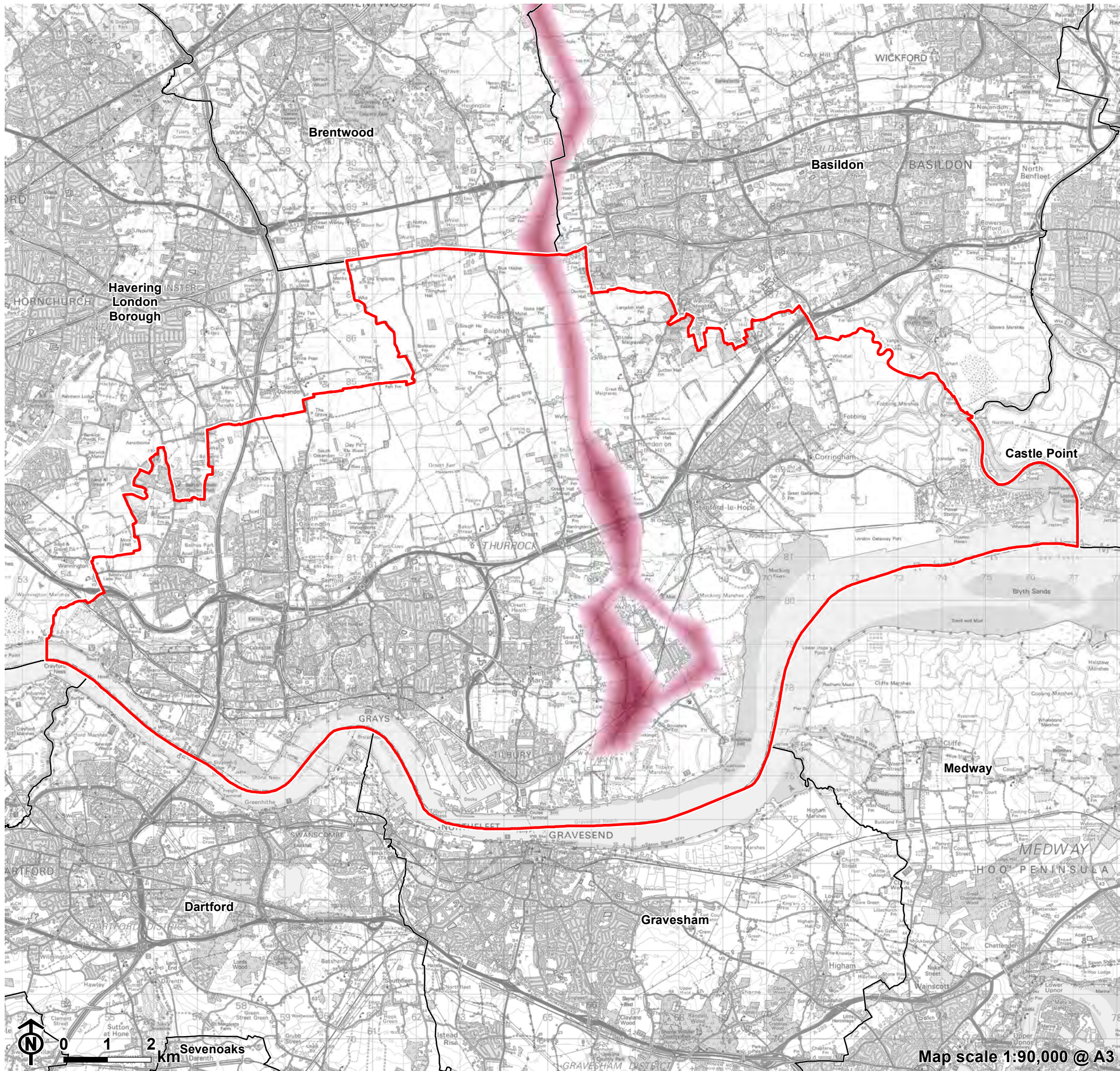
3.35 The National Grid aims to reinforce the electricity transmission network between Norwich Main substation in Norfolk and Tilbury substation in Essex with a proposed new 180km 400 kV overhead line that would pass through Thurrock [\[See reference 39\]](#).

3.36 Other auxiliary operations would be needed to facilitate construction and operation of the project, these include:

- Temporary land for construction activities, including working areas for construction equipment and machinery, site offices, welfare, storage, and access; and
- land required for environmental mitigation, compensation, and enhancement as a result of the environmental assessment process and Biodiversity Net Gain.

3.37 National Grid is committed to delivering 10% biodiversity net gain on all projects and will be looking to partner with land managers to deliver this. This GBI strategy therefore provides an important opportunity to identify suitable projects for National Grid to fund.

3.38 As demonstrated in **Figure 3.4**, the GREEN proposals [\[See reference 40\]](#) for Thurrock involve the preferred corridor travelling from the north of the Borough south, passing Bulphan on the west and then Horndon on the Hill on the east. The route crosses the A13 and heads towards Linford and East Tilbury; the route would then pass either to the west or east side of these settlements. Currently National Grid are considering the most appropriate route from this point. A new overhead line supported by steel lattice pylons is expected to be used for strengthening in this segment. To connect the new line some work at Tilbury substation would need to be undertaken, which is expected to be contained inside the substation's existing boundaries [\[See reference 41\]](#).



**Figure 3.4: Proposal for East Anglia
GREEN**

-  Thurrock Council boundary
-  Neighbouring authority boundary
-  Indicative route corridor for overhead line

How GBI can address Nationally Significant Infrastructure

- Implementation of GBI within and surrounding the Lower Thames Crossing and GREEN can help to mitigate their potential adverse effects relating to landscape, cultural heritage, flooding, biodiversity, water quality, and pollution (air, light and noise) e.g. the new footpaths, bridging points, biodiversity enhancement.
- These large-scale projects present an opportunity for significant investment in GBI in Thurrock. This GBI strategy needs to clearly identify and justify suitable projects for investment.

Development within Green Belt

3.39 Much of Thurrock's open land is designated as Green Belt, which provides five purposes (as set out in paragraph 138 of the National Planning Policy Framework):

- To check unrestricted sprawl of large built-up areas;
- To prevent neighbouring towns merging into one another;
- To assist in safeguarding the countryside from encroachment;
- To preserve the setting and special character of historic towns; and
- To assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

3.40 Paragraph 145 of the NPPF states that:

3.41 “Once Green Belts have been defined, local planning authorities should plan positively to enhance their beneficial use, such as looking for opportunities to provide access; to provide opportunities for outdoor sport and recreation; to retain and enhance landscapes, visual amenity and biodiversity; or to improve damaged and derelict land.”

3.42 Sometimes it is necessary to release land from Green Belt designation, for development. Paragraph 142 states that:

3.43 “Where it has been concluded that it is necessary to release Green Belt land for development, plans should give first consideration to land which has been previously-developed and/or is well-served by public transport. They should also set out ways in which the impact of removing land from the Green Belt can be offset through compensatory improvements to the environmental quality and accessibility of remaining Green Belt land.”

3.44 Some areas of Green Belt have poor landscape quality, for example due to mineral extraction. The GBI Strategy can therefore help to make better use of existing and remaining Green Belt, by improving accessibility, landscape quality and biodiversity, and by considering individual sites as part of a wider GBI network.

How GBI can address the Green Belt

- Implementation of GBI can help to enhance Green Belt by creating spaces with multiple functions, such as through the creation of new recreational spaces or new cycle & pedestrian routes helping to promote health and wellbeing of adjacent urban areas, or by enhancing landscape and biodiversity.

- Development in or near to Green Belt can be required to provide compensatory improvements, e.g. to access, landscape and biodiversity.

Development of brownfield land

3.45 Brownfield land is any previously development land that is not currently in use, and could include areas of former industry or quarrying.

3.46 The National Planning Policy Framework (paragraph 120) states that planning policies and decisions should “give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land”.

3.47 Developing brownfield sites within or adjacent to existing settlements can help to create sustainable settlement patterns such as residential growth around mixed use centres and transport hubs. It can also increase pressure on urban greenspace, by increasing population density, but also create opportunities to provide new GBI as part of urban development.

3.48 Thurrock has large areas of minerals resource [\[See reference 43\]](#) throughout the south and west of the borough, where the extraction of sand and gravel or chalk has occurred, or could occur in the future. These sites can create a challenge for development, for example because of the topography or requirements for remediation. However, former minerals sites in Thurrock have been put to a variety of uses, such as:

- Development, for example at Lakeside;
- Biodiversity and geodiversity, for example Purfleet Chalk Pits SSSI, Grays Thurrock Chalk Pit SSSI, and Chafford Gorges Local Nature Reserve;
- Landfill (and then other uses once restored, when landfill ceases), for example at Aveley;

- Lakes, for example at Grangewaters.

3.49 Many of Thurrock's brownfield sites, including former minerals extraction sites, are important for invertebrates.

How GBI can address brownfield land

- Identifying the value of brownfield land for biodiversity, landscape, recreation and development can help prioritise areas for new GBI.
- GBI Strategy can inform policies that require GBI in brownfield development.
- Where brownfield land is not suitable for built development, there may be opportunities for new GBI.

Chapter 4

Thurrock's GBI Assets

4.1 This section of the report provides an overview of Thurrock's existing GBI assets. Drawing on relevant GIS data and recent evidence base studies, key GBI issues and opportunities are drawn out in relation to each type of asset.

Landscape

4.2 Thurrock is a low-lying area, located on the northern bank of the River Thames where it expands into an estuary. Thurrock exhibits a mosaic of markedly contrasting landscapes, from open and relatively tranquil and undeveloped farmland in the rural parts of the Borough to the north, to the densely developed urban areas and industrial development adjacent to the windswept grazing marshes along the Thames riverside.

4.3 A Landscape Character Assessment (LCA) and Landscape Sensitivity Evaluation (LSE) [\[See reference 44\]](#), [\[See reference 45\]](#) were prepared in parallel with the draft GBI Strategy (ie in 2018), and remain the most up to date assessments of landscape character for the borough.

4.4 The LCA identifies seven strategic landscape character types and areas, 12 local scale character types and 24 local scale character areas. These are presented in **Figure 4.1**. The LCA provides a profile of each landscape character type, divided into local scale character areas, where applicable. This includes identification of the key features and vulnerabilities of each area, as well as a vision for each area and guidance to conserve and enhance the character of the area.

4.5 The LSE provides a sensitivity rating to different kinds of development within each landscape character area. Many of the landscape areas which comprise

open countryside are assessed as having moderate to high sensitivity to most types of development [\[See reference 46\]](#).

4.6 Thurrock also forms part of the Northern Thames Basin National Character Area (NCA), which extends from Hertfordshire in the west to the Essex coast in the east. The Northern Thames Basin is an area rich in geodiversity, archaeology and history and diverse landscapes ranging from the wooded Hertfordshire plateaux and river valleys, to the open landscape and predominantly arable area of the Essex heathlands, with areas of urbanisation throughout. Urban expansion has been a feature of this area since the 16th century, and it increased dramatically from the mid-19th century as infrastructure improved and people could travel to work in London from the surrounding areas. This has put increased pressure on the area in terms of extra housing developments, schools and other necessities for expanding populations, with a consequential reduction in tranquillity [\[See reference 47\]](#).

4.7 Thurrock also falls within the Greater Thames Estuary NCA, a predominately remote and tranquil landscape of shallow creeks, drowned estuaries, low-lying islands, mudflats and broad tracts of tidal salt marsh and reclaimed grazing marsh. The coastal habitats here are internationally important for their biodiversity and support large numbers of wintering and breeding wetland birds, rare plant and invertebrate species, and diverse marine wildlife [\[See reference 48\]](#).

4.8 The LCA also sets out the cultural and historical influences on Thurrock's landscape, including ancient field systems and the importance of the marshes in connecting the past and the present (see Historic Environment, below).

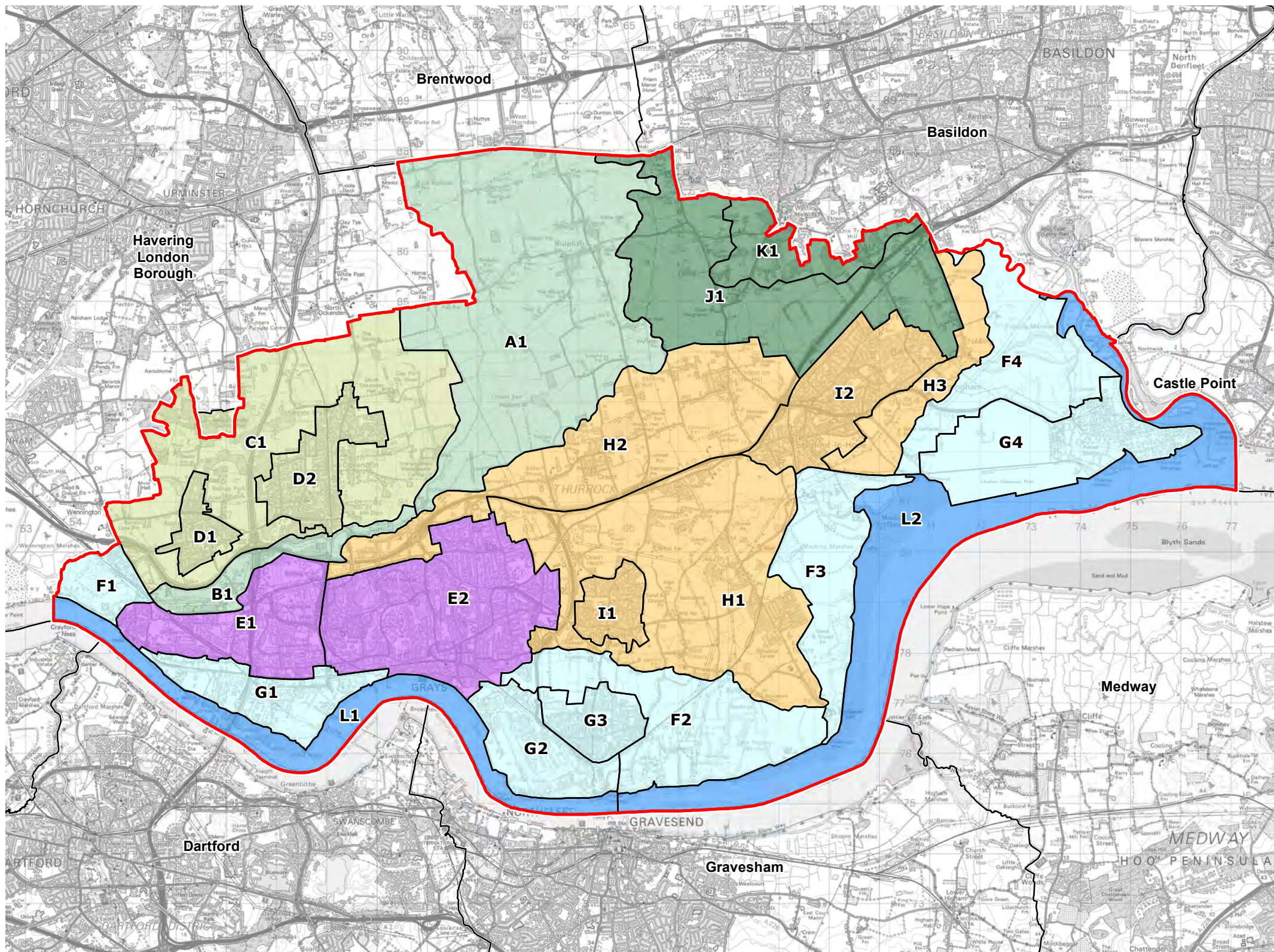


Figure 4.1: Landscape character

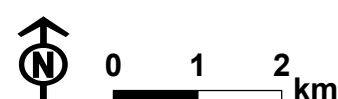
- Thurrock Council boundary
- Neighbouring authority boundary

Landscape Character Area

- A1: Bulphan Fenland
- B1: Lower Mar Dyke River Valley
- C1: Belhus Farmed River Terrace Gravels
- D1: Aveley
- D2: South Ockendon
- E1: West Thurrock, Lakeside & Purfleet
- E2: Grays, Chafford Hundred & South Stifford
- F1: Aveley Marshes
- F2: Tilbury Marshes
- F3: Mucking Marshes
- F4: Fobbing Marshes & Haven Creek
- G1: West Thurrock Marshes
- G2: Tilbury Docks
- G3: Tilbury
- G4: London Gateway Port
- H1: East & West Tilbury Open Undulating Farmland
- H2: Orsett & Horndon on the Hill Open Undulating Farmland
- H3: Fobbing Ridge Open Undulating Farmland
- I1: Chadwell St Mary
- I2: Stanford-le-Hope & Corringham
- J1: Langdon Lower Hill Slopes
- K1: Langdon Higher Hills
- L1: Long Reach to Northfleet Hope
- L2: Gravesend Reach to Sea Reach

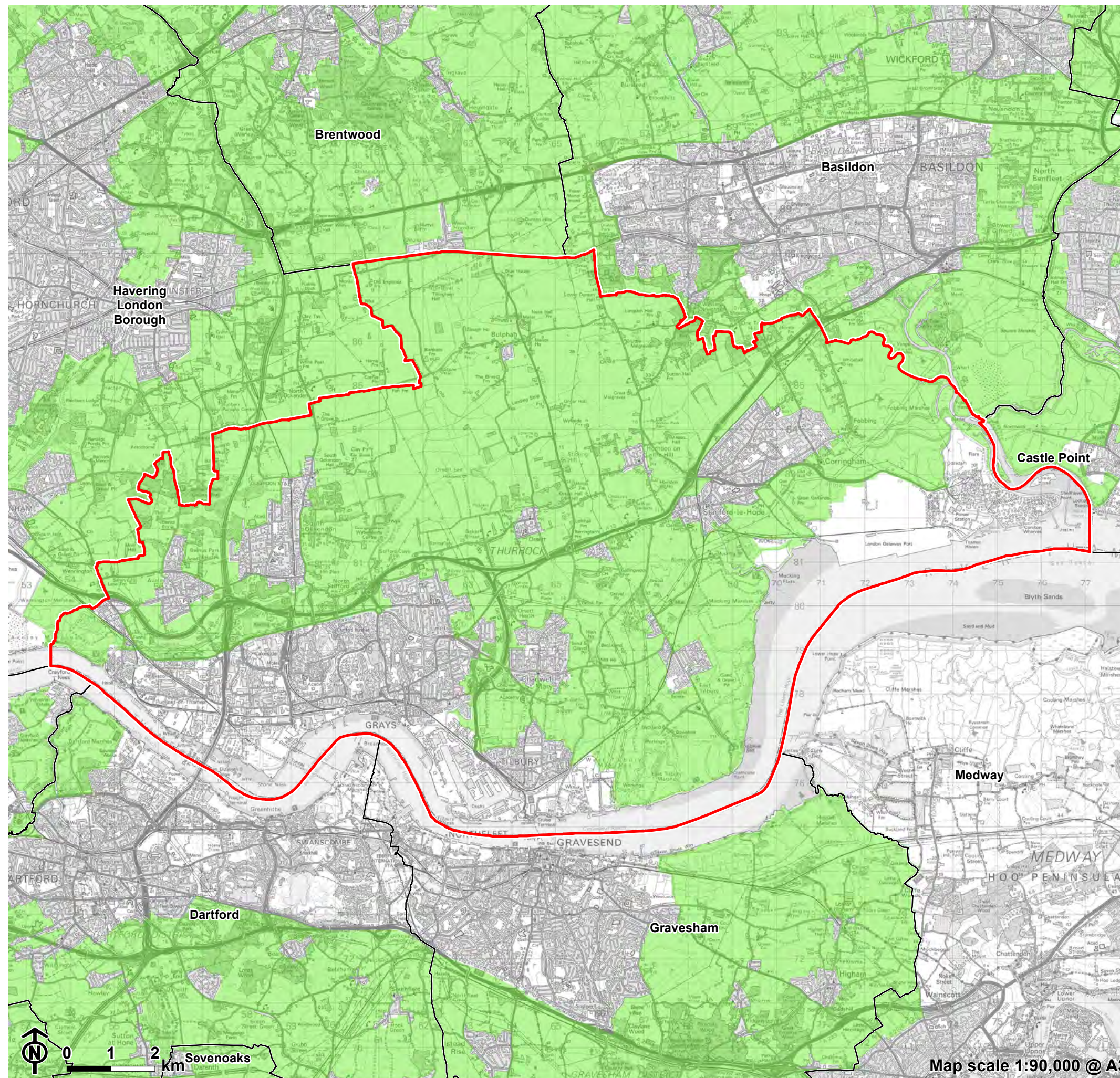
Landscape Character Type

- A: Fenland
- B: River Valley
- C: Farmed River Terrace Gravels
- D: Towns on River Terrace Gravels
- E: Settled Chalk Ridge
- F: Undeveloped Marsh
- G: Developed Marsh
- H: Open Undulating Farmland
- I: Towns on Farmland
- J: Lower Hill Slopes
- K: Higher Hills
- L: Local River Reaches



Map scale 1:90,000 @ A3

Figure 4.2: Green Belt



- Thurrock Council boundary
- Neighbouring authority boundary
- Green Belt

4.9 The majority of Thurrock outside of towns and villages is designated as Green Belt (see **Figure 4.2**). The Stage 1a and 1b Green Belt Assessment [\[See reference 49\]](#) identifies that Green Belt in the west of the Borough plays an important role in preventing the unrestricted sprawl of large built-up areas. Green Belt north of Purfleet and Grays prevents the merger of South Ockendon and Aveley; and Green Belt parcels between Stanford-le-Hope, Corringham and Basildon serve the same function.

4.10 The tranquillity of the rural landscape in the borough has been diminished by major infrastructure; however, the visual separation of rural edge settlements remains highly valuable. In some cases, the edges of settlements are defined by roads or by urban development and large industrial units on the settlement edges, which reduces the visual separation of settlements.

4.11 In other cases, Green Belt boundaries are defined along weak features such as the rear gardens of houses, which often do not benefit from features that would provide reinforcement such as hedgerows or tree belts. The Assessment highlights the need for policies that enhance Green Belt boundaries and strengthening of green infrastructure.

Issues

- Many parts of Thurrock's landscape have been degraded through uses such as industry, and gravel extraction.
- Thurrock's landscape will be subject to significant change as a result of major developments such as the proposed NSIPs, new roads, residential expansion, employment hubs and tall structures. These may all potentially have an adverse impact on landscape character and views.
- Much of the borough is designated as Green Belt, which development could affect, e.g. developments at or adjacent to the settlement edge could result in a sense of encroachment into the surrounding countryside.

Opportunities and needs

- Conserve and enhance valuable landscapes, while seeking to also support health and wellbeing, growth and development.
- Restore and enhance areas with poor landscape quality such as gravel extraction and landfill sites, or areas close to major development, integrating additional GBI functions such as recreation and biodiversity.
- Promote the heritage of Thurrock's historic landscapes such as marshland through restoration, enhanced access, and interpretation (in balance with conserving biodiversity; see below).
- Enhance Green Belt by improving access and biodiversity, and by strengthening its edges.

Historic environment

4.12 Thurrock has a rich historic environment and contains a large number of designated assets (**Figure 4.3**). This includes 13 Grade I listed buildings, 19 Grade II* listed buildings and 212 Grade II listed buildings. In addition, there are seven Conservation Areas in Thurrock, 17 Scheduled Monuments and one Grade II registered park and garden at Belhus Park. The following assets are identified by Historic England as being 'at risk':

- State Cinema, George Street, Grays (Grade II*).
- Coalhouse Fort, Tilbury (Scheduled Monument; **Figure 4.4**).
- Crop mark complex, Orsett (Scheduled Monument).
- East Tilbury (Conservation Area, 11 Listed Buildings) **[See reference 50]**.

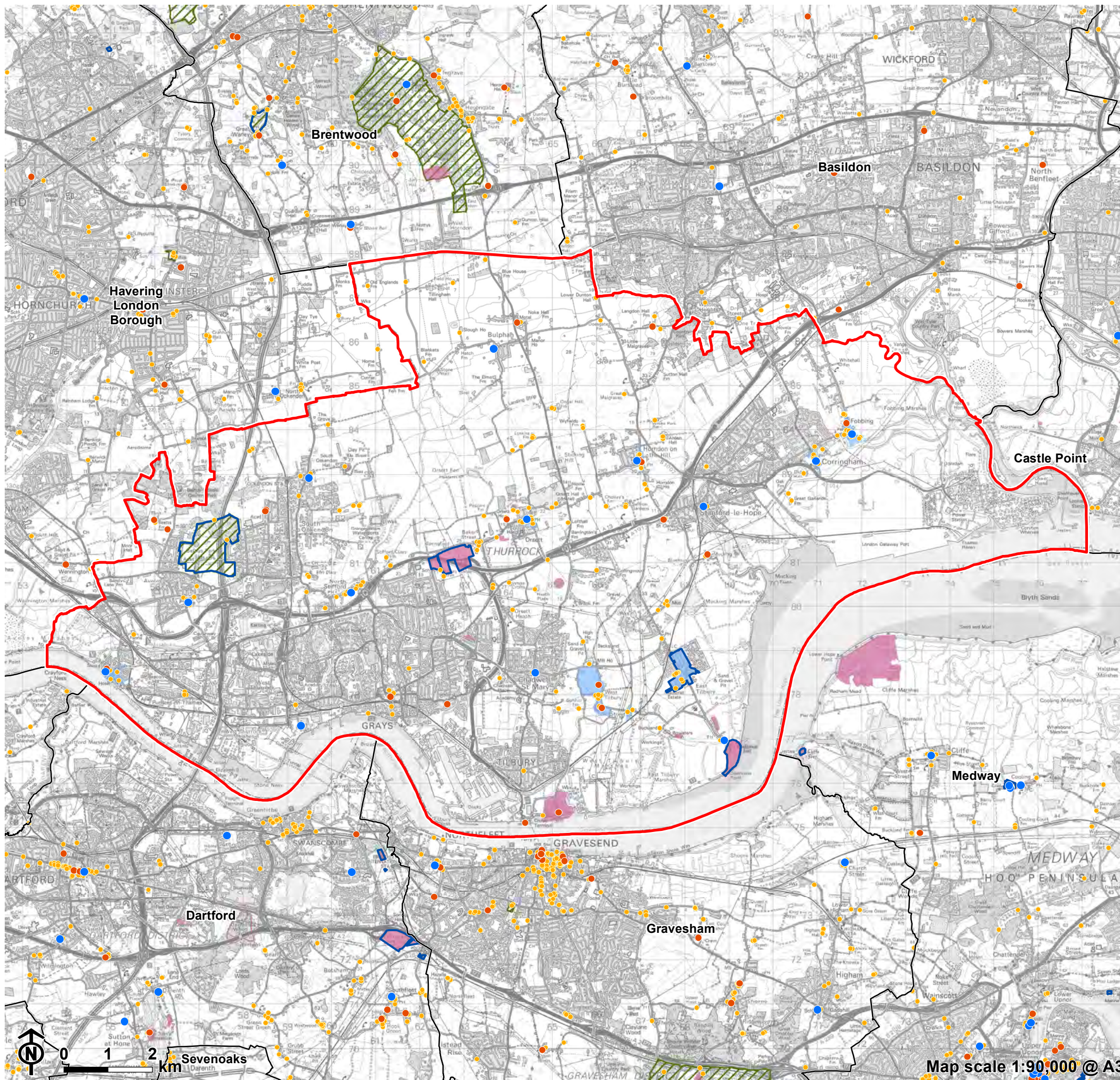


Figure 4.3: Historic Environment

- Thurrock Council boundary
 - Neighbouring authority boundary
 - Scheduled monument
 - Conservation area
 - Heritage at Risk
 - Registered Parks and Gardens
- Listed building**
- Grade
- I
 - II*
 - II

Figure 4.4: Moat at Coalhouse Fort



4.13 The Thames riverfront is the site of some of the borough's most important historic assets, including Coalhouse Fort and Tilbury Fort, but other parts of the estuary coast are also historically important. For example, at Purfleet the Mardyke River was channelled as part of the old munitions fortified landscape and there is an original landing stage and a volunteer-run museum. Rainham Marshes was also used as a firing range for WW2 and retained military features.

4.14 As described in the Landscape Character Appraisal (see above), the first towns began to develop in Thurrock in the Iron Age, with identified Roman and medieval settlements up to the modern day. Humans have also changed the landscape through time, for example through development, farming and reclamation of marshland. A changing climate continues to alter the historic landscape and features within it, particularly along the Thames estuary.

4.15 Further change will occur in Thurrock that will affect historic assets and landscapes. For example, the proposed Lower Thames Crossing tunnel entrance is situated between Tilbury Fort and Coalhouse Fort, and increased

risk of flooding. The development would retain the right of way that links the two forts (which is part of the England coast path) and a new landscaped open space is proposed close to the tunnel entrance, but the new motorway will impact upon the historic landscape and the setting of the forts.

Issues

- Development pressure such as from new housing, employment sites, and the NSIPs has the potential to affect the setting of designated heritage assets.
- Environmental pressures present a direct risk to designated heritage assets, through extreme weather and flooding.
- Thurrock's historic features may not be accessible or appealing to a broad cross section of Thurrock residents.

Opportunities and needs

- Implement GBI to conserve and enhance the setting of designated heritage assets.
- Use GBI to improve the resilience of heritage assets to extreme weather and flooding.
- Promote the enjoyment and appreciation of heritage assets by increasing access and providing recreation opportunities at sites.

Biodiversity

4.16 Thurrock has a rich biodiversity resource. Key habitats in Thurrock include **[See reference 51]**:

- Estuarine Habitats – Thurrock's riverside supports some of Thurrock's most important wildlife sites. Though much of Thurrock's former grazing marsh has been lost to development and conversion to arable farmland,

significant areas remain. This habitat provides a complex of coastal grassland, watercourses and fringing saltmarsh and mudflats that support numerous invertebrates, birds and nationally rare plants. Coastal habitats such as saltmarsh also play a role in storing carbon and as natural flood protection.

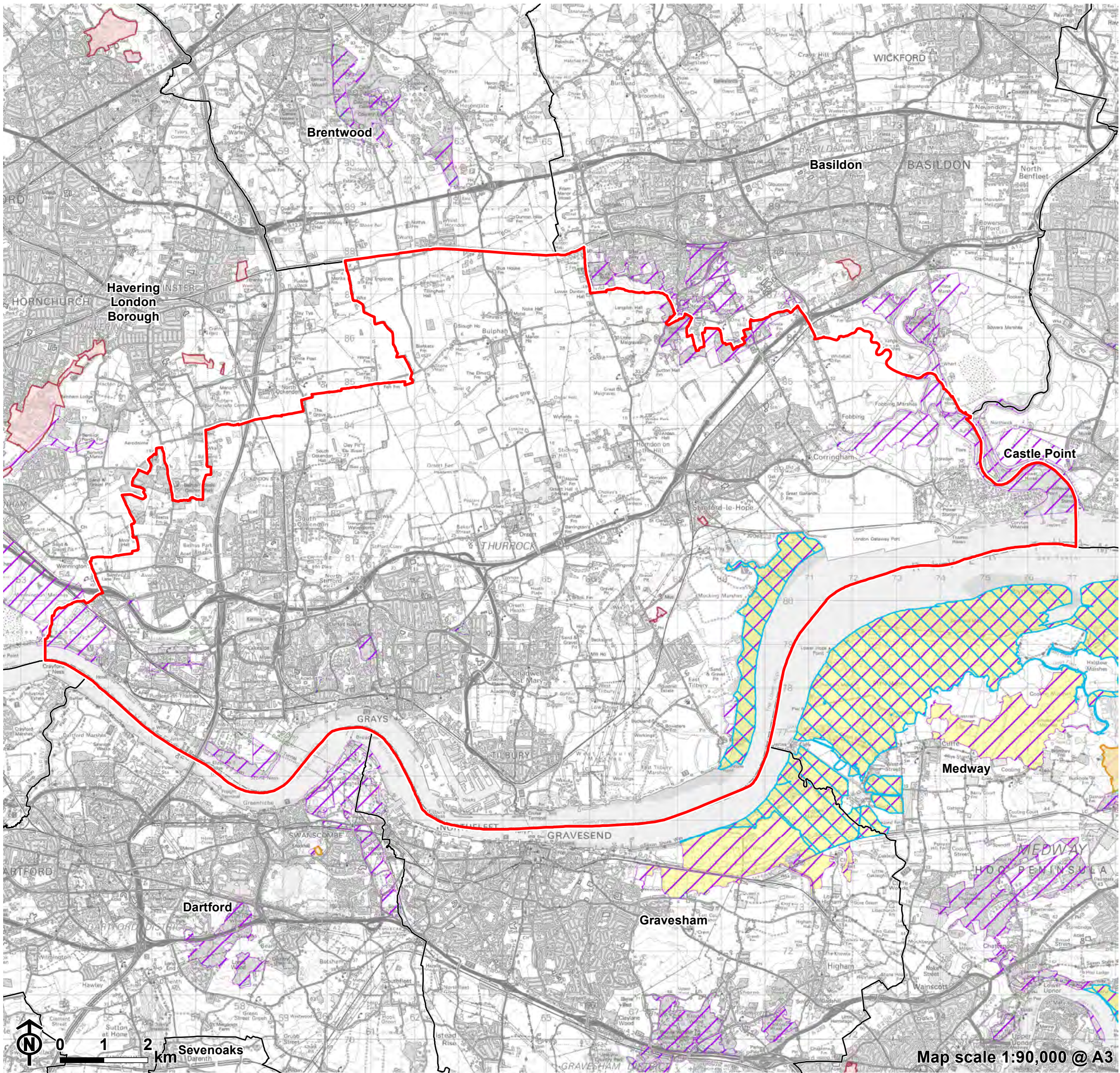
- Farmland – As a mosaic of ditches, hedgerows, woods, ponds, pasture and field margins, farmland can support a great diversity of wildlife, including many biodiversity priority species (e.g. Grey Partridge, Skylark). A small proportion of the borough's agricultural areas (mostly in the east) are under stewardship agreements, which incentivise environmentally responsible farming practices.
- Thames Terraces - The Chadwell Ridge (Grays to Fobbing) and Purfleet-Grays ridges rise from the Thames to a height of 25m above sea level, forming a central belt of sands and gravels across the Borough. Where the soils remain unimproved or the underlying minerals are exposed due to extraction, areas of grassland and short scrub support nationally important assemblages of invertebrates.
- Woodland – Thurrock has several small semi-natural broadleaved woods in the north of the Borough. Most of these are former coppice woods that were managed to produce a rotational harvest of wood and timber. Such woods support a wide range of birds, mammals, plants and fungi. Woodlands also play an important role in carbon sequestration [\[See reference 52\]](#).

4.17 Within these areas there are a range of internationally, nationally and locally important sites for nature conservation, as well as areas of ancient woodland and protected or notable habitats and species (**Figure 4.5** and **Figure 4.6**). These include the following:

- Thames Estuary and Marshes SPA and Ramsar Site (species from this site also make use of other wetland habitats in the area, which creates a 'functional linkage' between those sites and the SPA/Ramsar).
- 12 Sites of Special Scientific Interest.
- Two local nature reserves; 70 Local Wildlife Sites;

- Priority habitats including ancient and semi-natural woodland, coastal and floodplain grazing marsh, good quality semi-improved grassland, coastal saltmarsh, mudflats and reed beds. Open mosaic habitat on previously developed land is of particular importance within Thurrock, many sites supporting a large number of rare invertebrates.

Figure 4.5: Biodiversity designations



- Thurrock Council boundary
- Neighbouring authority boundary
- Special Protection Area
- Site of Special Scientific Interest
- Ramsar
- National Nature Reserve
- Local Nature Reserve

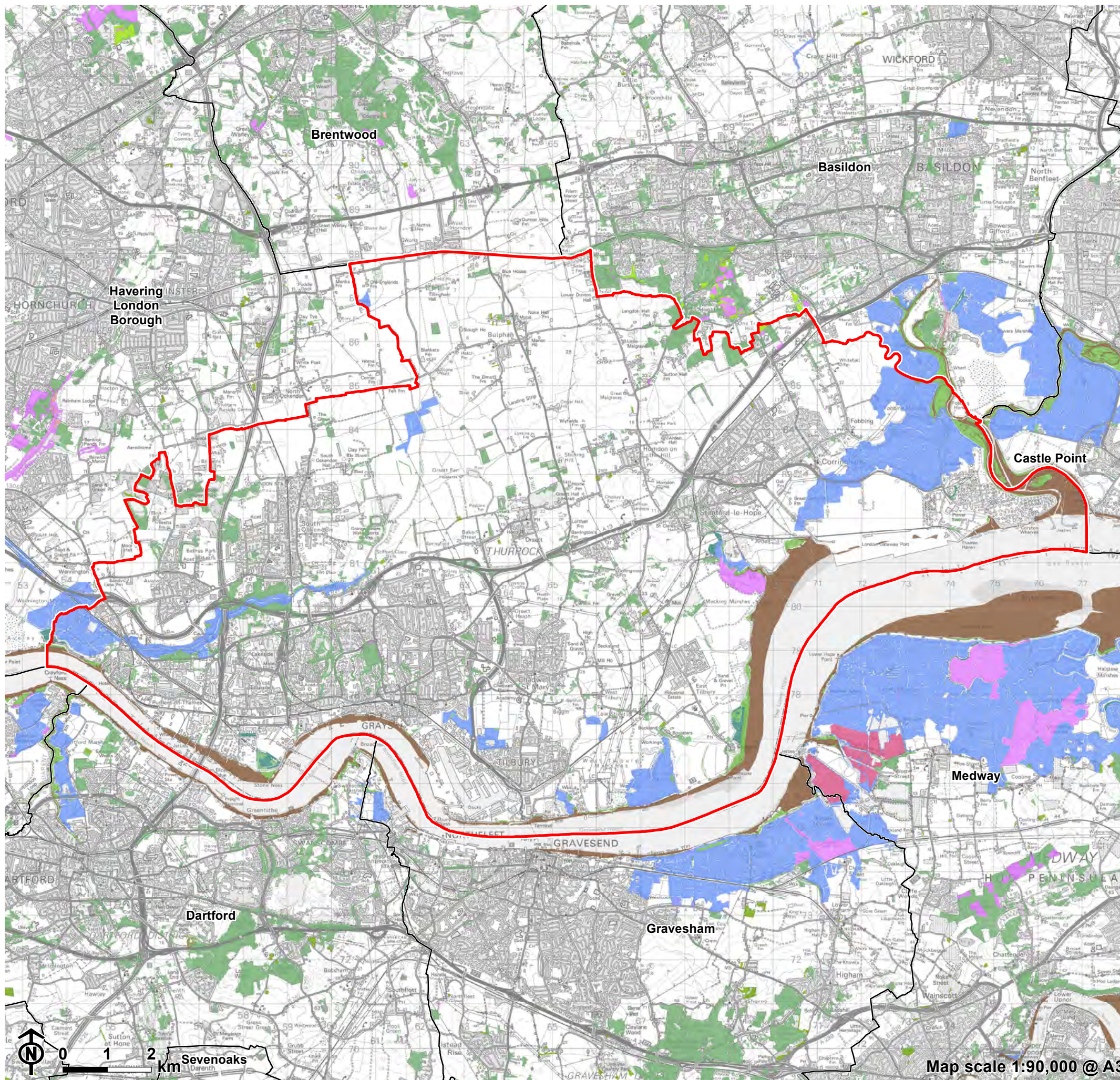


Figure 4.6: Priority habitats

- Thurrock Council boundary
- Neighbouring authority boundary

Priority Habitat Inventory

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Deciduous woodland
- Good quality semi-improved grassland
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland meadows
- Mudflats
- Reedbeds
- Saline lagoons
- Traditional orchard

4.18 Natural England data [\[See reference 53\]](#) indicate that there are a number of SSSIs in relatively poor condition [\[See reference 54\]](#) in the Borough, including:

- West Thurrock Lagoon & Marshes – ‘Unfavourable declining’, due to coastal squeeze and disturbance.
- Inner Thames Marsh – southern portion is ‘Unfavourable declining’, due to erosion.
- Purfleet Road – ‘Unfavourable no change’ due to use of motorbikes and fly tipping.
- Purfleet Chalk Pits – north-western portion and south-western portion are ‘Unfavourable declining’ due to scrub encroachment.
- Vange & Fobbing Marshes – ‘Unfavourable recovering’, due to previous habitat management.
- Mucking Flats and Marshes – Area to the south-east ‘Unfavourable recovering’ due to previous habitat management.
- Langdon Ridge – ‘Unfavourable recovering’ for reasons that have not been published, although parts of the site are vulnerable to recreation pressure.
- Grays Thurrock Chalk Pit – ‘Unfavourable recovering’ due to previous habitat management.

4.19 A number of priority species were also identified within the 2006 Thurrock Biodiversity Study [\[See reference 55\]](#). This study is currently being updated.

4.20 Many of Thurrock's most important wildlife sites are located in urban areas; such as the six SSSIs in Grays and Purfleet. Sites of importance for invertebrate populations can also be found in the urban areas of Grays, Purfleet, West Thurrock, and Tilbury. For example, the Oliver Road Lagoons is a brownfield site in West Thurrock that is one of the best sites within the country for invertebrates. These sites are therefore at risk from development, which can cause loss of, or fragmentation and damage, to habitats. There are also sites where biodiversity is currently limited and could be improved, for example the

flooded gravel pits around South Ockendon, which lack marginal wetland habitat.

4.21 Thurrock's biodiversity assets have value in their own right, but can also be thought of as having 'natural capital'. A natural capital approach considers the value of the natural environment for people and the economy. This value is largely made up of:

- Provisioning services – products from nature such as food, water, energy and materials. This includes agriculture, water extraction, renewable energy and mineral extraction.
- Regulating services – services helping to maintain the quality of our environment, such as carbon sequestration to remove greenhouse gases, parks and blue spaces to cool, and vegetation to remove air pollutants.
- Cultural services – these are non-material benefits people obtain from natural capital, such as tourism, recreation and aesthetic experience.

4.22 Natural England's Natural Capital Atlas for Essex [\[See reference 56\]](#) highlights the natural capital value and ecosystem services of biodiversity assets in Essex. It shows that Thurrock's assets provide a range of services, although greater benefits could be achieved by improving the quality and quantity of the assets (e.g. increased areas of woodland and orchard; improved quality of watercourses). The National Character Area analyses for the Northern Thames Basin [\[See reference 57\]](#) and Greater Thames Estuary [\[See reference 58\]](#) (see also 'landscape', above), also show that environmental opportunities that would improve the landscape character of those areas would increase the provision of ecosystems services.

4.23 Opportunities should be sought for biodiversity protection and to fund and deliver new or enhanced GBI through new development. The Lower Thames Crossing proposals include mitigation for identified impacts, including the translocation of protected species; however adverse effects on biodiversity may still remain. National Highways is also making Designated Funds available for biodiversity enhancement projects in Thurrock (see 'Lower Thames Crossing' section of Chapter 3). Consideration should be given to how mitigation for

Lower Thames Crossing and other large developments could be integrated to create more larger, more resilient blocks of habitat.

4.24 An increase in population will increase the demand for recreational spaces within reach of the new housing, for example locations for people to picnic, hike, walk their dogs, swim, sail and undertake many other activities. New recreational spaces could adversely affect biodiversity as change in land use could fragment established habitats and recreation could damage sensitive habitats or disturb sensitive species, unless appropriately managed. The Thames Estuary and Marshes SPA and Ramsar site, in particular, is sensitive to recreation pressure.

4.25 Thurrock is a partner of a county-wide mitigation strategy in place for the Thames Estuary and Marshes SPA and Ramsar site and other internationally designated coastal sites. The Essex Coast Recreational disturbance Avoidance & Mitigation Strategy (RAMS) has been adopted as a Supplementary Planning Document [\[See reference 59\]](#). The strategy requires new residential developments within a 'zone of influence' of the coastal sites to pay a tariff that will fund strategic access management and monitoring. The zone of influence for Thames Estuary and Marshes SPA and Ramsar is 8.1km (5 miles), which incorporates approximately half of the borough.

Issues

- Some of the borough's SSSIs are in poor condition.
- Development (including NSIPs, but also smaller developments) can have adverse impacts on flora and fauna; therefore intelligent design and remediation of land are required to minimise and offset such impacts and enhance biodiversity.
- Poor water quality can have an adverse effect on biodiversity (see 'blue infrastructure', below)
- The need for recreation must be balanced with the protection of biodiversity, for example at the Thames Estuary and Marshes SPA and Ramsar site.

Opportunities and needs

- Conserve and enhance the biodiversity value of designated sites through habitat management, creation and reconnection.
- Implement appropriate management and educational regimes in ecologically sensitive areas. This is particularly important for the creation of new recreational spaces and the Thames Estuary and Marshes SPA and Ramsar.
- Remediate degraded areas of land to mitigate any potential loss from development and provide net gain in biodiversity.
- Improve the water quality and biodiversity of Thurrock's waterways such as the River Mardyke.
- Increase the area of habitats that sequester carbon (e.g. broadleaved woodland and saltmarsh); and protect habitats with a climate change adaptation function (e.g. saltmarsh).

Open space

4.26 There are over 1,575 hectares of open space in Thurrock, of which 80% (1,255 hectares) is natural and semi-natural greenspace (see **Figure 4.7**). Provision of suitable open space is vital for promoting health and wellbeing, as well as providing other GBI benefits.

4.27 A draft Thurrock Open Space assessment report [\[See reference 60\]](#) was completed in May 2017 for Thurrock Council, following on from the Open Space Standards Report completed in September 2016 [\[See reference 61\]](#). Together these two documents help identify the deficiencies and surpluses in existing and future provision of open space in Thurrock. More recently, Natural England has published GBI mapping [\[See reference 62\]](#) that shows variation in access to open spaces, geographically and in relation to patterns of deprivation. The findings of these relevant to Thurrock are summarised below.

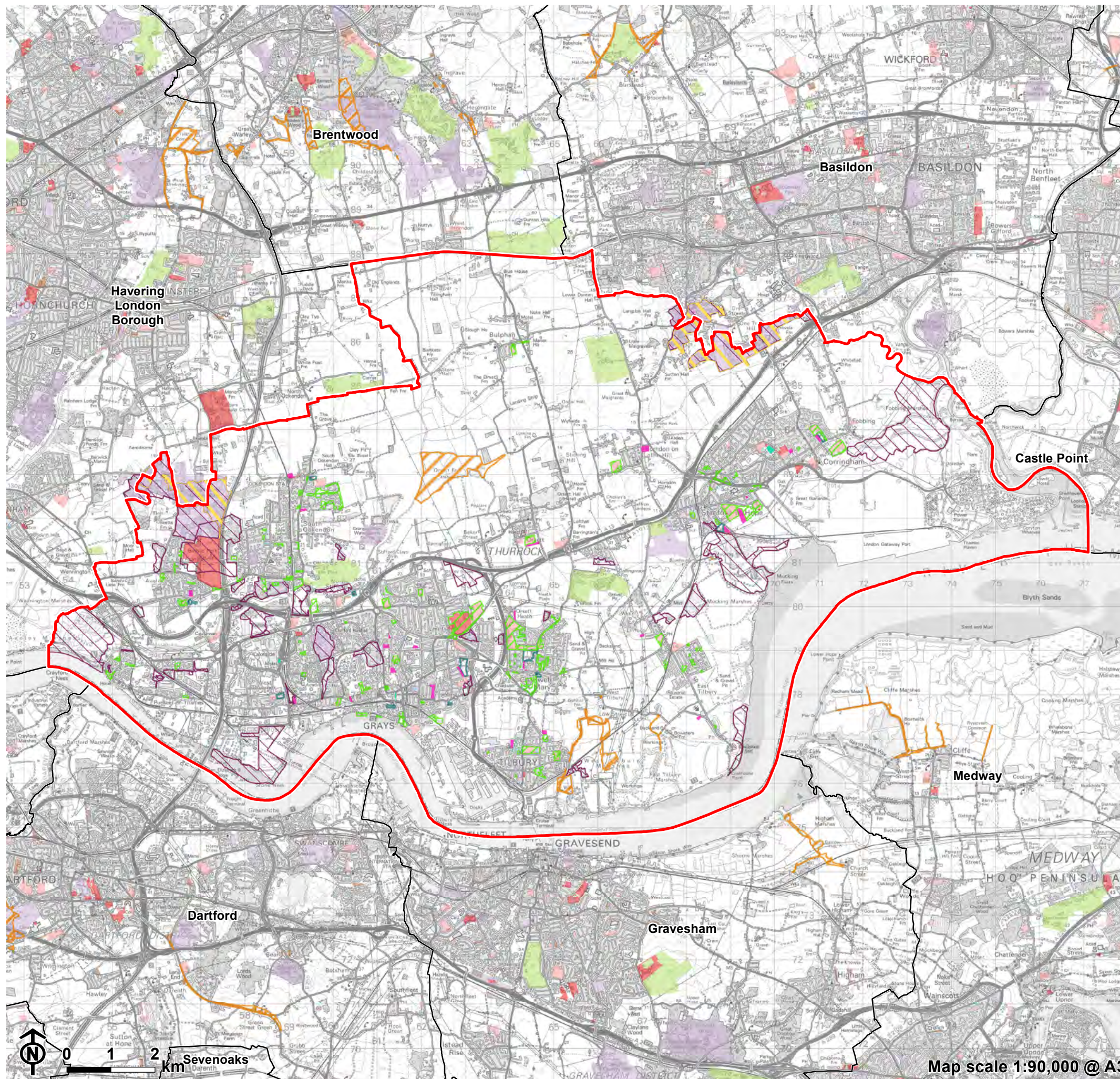


Figure 4.7: Open space

- Thurrock Council boundary
- Neighbouring authority boundary
- Cemetery*
- Registered Common Land
- Country park
- Amenity green space*
- Semi natural greenspace*
- Civic space*
- Allotment
- Activity Spaces Provision
- Allotments and Community Growing Spaces
- Golf Course
- Sports Facilities
- Play Space Provision
- Playing Fields
- Public Park - General

*Note: Indicative Data - Data from previous Thurrock project in 2016

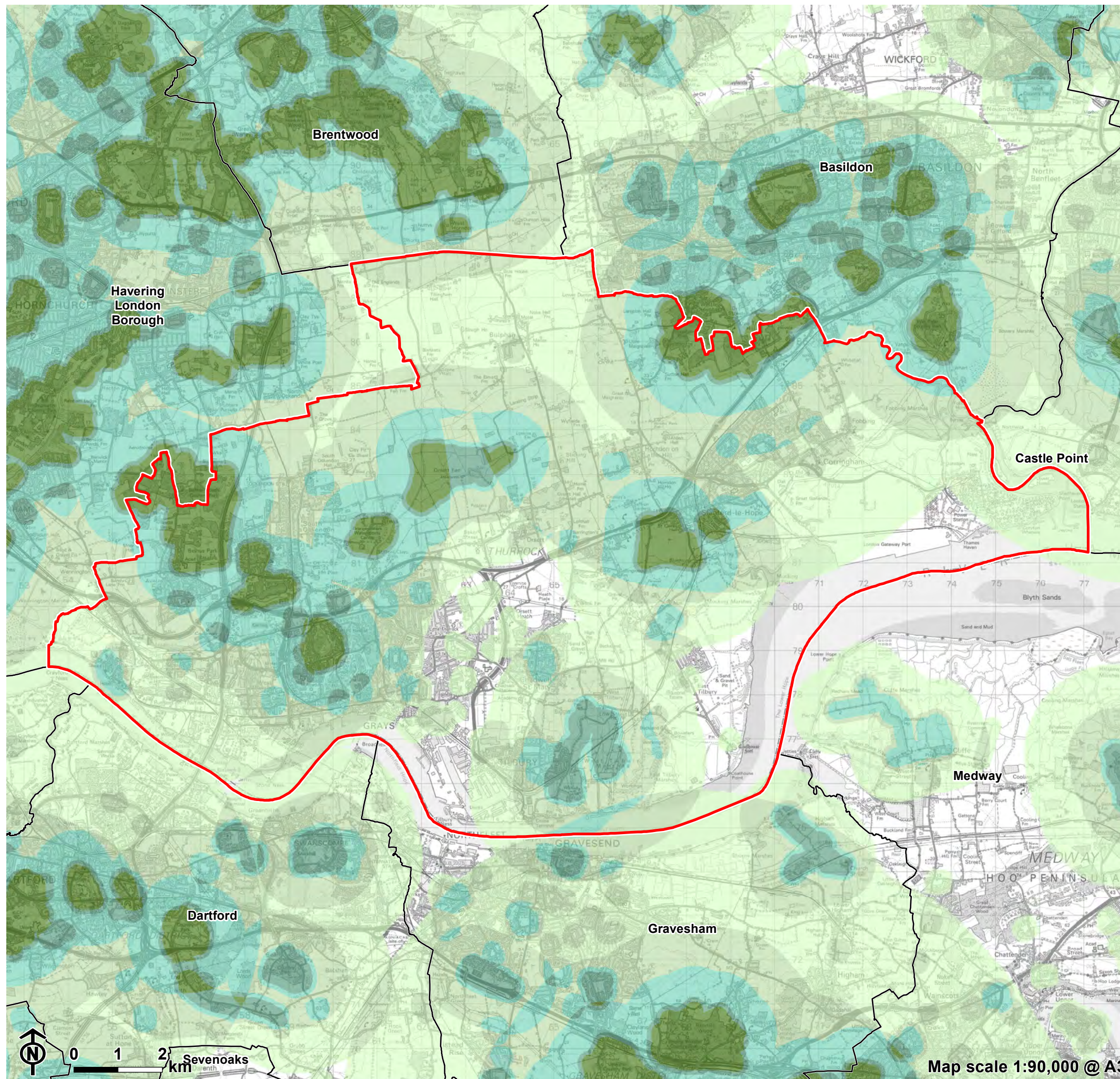


Figure 4.8: Access to open space

- Thurrock Council boundary
- Neighbouring authority boundary
- Accessible Natural Greenspace**
- ANGSt Profile**
- Meets 1 ANGSt standard
- Meets 2 ANGSt standards
- Meets 3 ANGSt standards
- Meets 4 ANGSt standards
- Meets 5 ANGSt standards
- Meets 6 ANGSt standards

Quantity of open space

Parks and gardens

4.28 The open space studies found a deficiency in the amount of Parks and Gardens within Thurrock with a provision of 0.41 hectares per 1,000 population compared with the Fields In Trust (FIT) standard 0.80 hectares per 1,000. There is a requirement for an additional 15.43 hectares across the Borough by 2037 to meet the current provision standard.

4.29 Areas identified as being deficient in access to parks and gardens are:

- South Aveley.
- Purfleet west of M25.
- Northern part of Grays/Chafford Hundred (south of A13) & North Stifford.
- Central area north of A13 (plus Southfields) - Orsett, Horndon on the Hill, Bulphan (note this area is in 70-90% least deprived in terms of health).
- West Tilbury/very south of Chadwell St Mary/very east of Tilbury.

Natural/semi-natural greenspace

4.30 The open space studies recorded sufficient provision of this type of open space, with a provision of 7.82 hectares per 1,000 population compared with the Fields In Trust (FIT) standard of 1.8 hectares per 1,000. To cater for expected population growth in the Borough, an additional 321.04 ha would need to be created by 2037 to meet the current standard. The open space study notes that it is unlikely that such large-scale levels of additional provision can be achieved and the focus should therefore be on ensuring that quality standards are being met.

4.31 The majority of natural and semi-natural greenspace in Thurrock (69%) can be attributed to a handful of large sites. This includes Belhus Wood Country Park (215 ha), Corringham Marshes (207ha), Fobbing Marsh (197ha), Langdon Hills Country Park (135ha) and Rainham & Aveley Marshes (117ha).

4.32 There are two local nature reserves (LNRs) accounting for 9.35ha in Thurrock. These are Grove House Wood (2.46 ha) and Linford Wood (6.89 ha). Thurrock currently has a deficiency in Local Nature Reserves based on Natural England's Accessible Natural Greenspace Standard (ANGSt) and would require an additional 41.87 hectares of LNR to achieve the standard.

4.33 Additional detail on accessibility to accessible natural greenspace is available from the Natural England mapping site. The mapping shows which areas of the borough meet the various ANGSt standards:

- Doorstep standard (green space of at least 0.5ha within 200m): patchy coverage, with significant gaps at West Thurrock, much of Grays, Stanford-le-Hope and Ockendon.
- Local standard (green space of at least 2ha within 300m): the areas that meet this standard are mainly in rural areas and not where the majority of people in the borough live.
- Neighbourhood standard (greenspace of at least 10ha within 1km): West Thurrock, Purfleet, Corringham, and most of Grays do not meet this standard.
- Wider Neighbourhood standard (greenspace of at least 20ha within 2km): Purfleet-on-Thames, the east of Grays, East Tilbury, Bulphan, and the south of Corringham do not meet this standard.
- District standard (greenspace of at least 100ha within 5km): most of the borough meets this standard, but there is a gap in coverage at the east of Grays, Chadwell St Mary, Tilbury and East Tilbury.
- Sub Regional standard (greenspace of at least 500ha within 10km): nowhere in the borough meets this standard.

4.34 Considering all the standards together, the areas with the poorest accessibility to natural greenspace are the east of Grays, East Tilbury, Corringham, West Thurrock and Bulphan.

4.35 The Natural England mapping overlays the ANGSt standards onto areas of deprivation (IMD). Parts of the east of Grays, South Ockendon, Purfleet on Thames and the edges of Chadwell St Mary have both high levels of deprivation and poor access to natural greenspace (accessibility depends on the standard used, as above). The east of Grays has high deprivation and scores poorly in terms of access across all standards.

Amenity greenspace

4.36 The open space studies found that Thurrock has a sufficient quantity of amenity greenspace with a provision of 1.15 hectares per 1,000 population compared with the Fields In Trust (FIT) standard of 0.6 hectares per 1,000. As for semi-natural greenspace provision, expected population growth means that there would need to be significant additional provision (45.97ha) by 2037 to continue to meet the standard.

4.37 Areas deficient in access to amenity green space identified in the studies are:

- West Grays.
- Areas in south and east of Purfleet.
- Grays – around A216 and eastern area around A1013.
- West Tilbury.
- Southfields.
- Central Corringham.
- North Orsett.

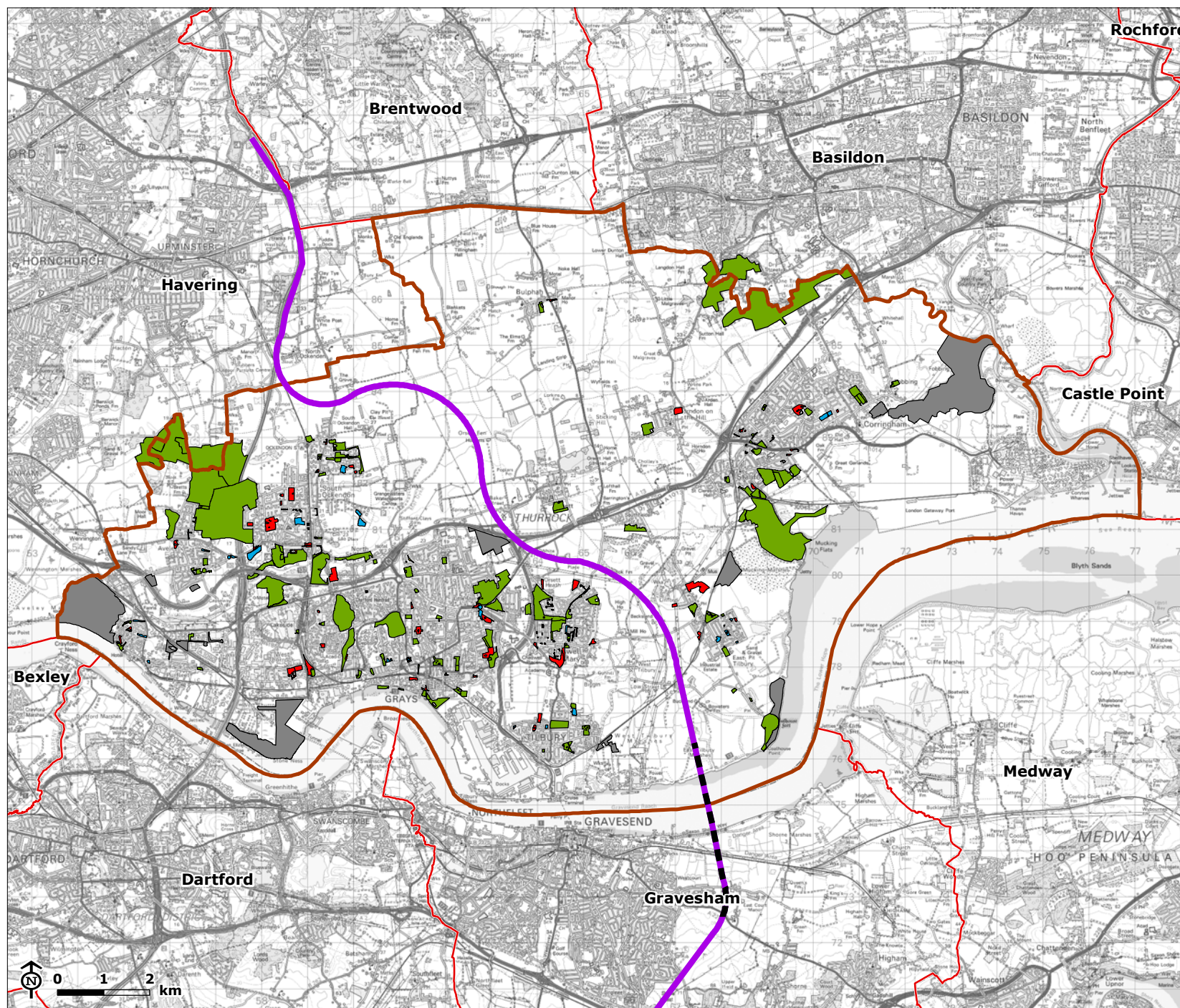
Thurrock Local Plan Green Infrastructure

Figure 4.9: Open space quality and value

- Thurrock
- Neighbouring authority
- Lower Thames Crossing
- Lower Thames Crossing tunnel

Open space quality and value

- High quality, high value
- High quality, low value
- Low quality, high value
- Low quality, low value
- No quality or value recorded



Source: NE, TC

Map Scale @ A4: 1:118,000

LUC

Quality and value of open space

4.38 The open space assessment assigned each open space in the Borough separate quality and value scores, as shown in **Figure 4.9**. The study used existing data (for example, including data collected for Green Flag Awards) and derived a scoring system for quality and value, from best practice guidance. The scores rated the open spaces out of 100 and these were judged against a notional 'threshold' score to show the number of sites with 'high' or 'low' scores.

4.39 A number of open spaces are judged to be low quality and low value. These are summarised for each typology in **Table 4.1** and **Table 4.2** below.

Table 4.1: Quality of open space

Typology	National Threshold Score	Lowest Score	Average Score	Highest Score	Number of sites (low)	Number of sites (high)
Allotments	50%	34%	55%	73%	6	18
Amenity greenspace	45%	18%	45%	74%	55	46
Natural & semi-natural greenspace	24%	48%	89%	54%	8	22
Park and gardens	50%	27%	50%	88%	12	12

Table 4.2: Value of open space

Typology	National Threshold Score	Lowest Score	Average Score	Highest Score	Number of sites (low)	Number of sites (high)
Allotments	20%	23%	29%	40%	0	24
Amenity greenspace	20%	13%	27%	54%	23	78
Natural & semi-natural greenspace	20%	6%	30%	68%	4	26
Park and gardens	20%	8%	36%	82%	4	20

4.40 These show that Thurrock's semi natural greenspace and allotments are generally of high quality and value. However, all allotments within the borough have waiting lists. Amenity greenspace and parks and gardens are more variable in terms of quality and value; and that there are a number of low quality sites that have high value, where improvements in quality should be focussed.

4.41 Thurrock Council recently published its Public Land Maintenance Strategy [See reference 64] which aims to ensure effective maintenance of public open spaces, but is also intended as a means of securing the funding and delivery of open space enhancement, and to increase biodiversity.

Issues

- Growth in Thurrock's population will require an increase in the quantity and quality of open space of all typologies to meet the current standards. Provision of new open space will be particularly important where proposed growth areas are in areas with poor access to open space.

- Access to accessible natural greenspace is particularly poor in the east of Grays.
- There are open spaces identified as low value/low quality and high value/low quality. There is a need to invest in enhancing the quality of all open spaces identified as low quality and in increasing the value of low value spaces, for example by improving access.
- Although semi-natural open spaces are accessible by car, some are more difficult to access by bicycle and on foot (see next section on active transport).

Opportunities and needs

- Increase the quantity and quality of parks and gardens. This could be achieved through creating new open spaces alongside new development or through formalisation of other forms of open space such as amenity greenspace and natural/semi-natural provision if these are surplus to requirements.
- Increase the quantity of Local Nature Reserves as a proportion of natural of semi-natural greenspace.
- Increase quantity of semi-natural greenspace to meet the current standard, particularly in the east of Grays.
- Consider filling in catchment gaps for parks and gardens, and amenity green space.
- Improve access to greenspace (see active transport).

Active transport

4.42 Safe accessible footpaths and cycle paths play an important role in connecting places and improving health and wellbeing through encouraging active travel; and can be incorporated into a GBI strategy where they provide

links to greenspaces or along green corridors. **Figure 4.10** and **Figure 4.11** show the existing active travel routes in the Borough.

4.43 Thurrock lacks a comprehensive network of Public Rights of Way, which are of particular benefit for recreational trips. There is an overall lack of connectivity, with large parts of the borough lacking any rights of way. Bridleways in particular are fragmented, meaning that there is a lack of long-distance routes suitable for safe horse riding. In places this fragmentation is due to the presence of marshes or land uses such as ports and industry, but there are also significant barriers that restrict movement, particularly from the urban areas to the surrounding countryside, where larger natural/semi-natural open spaces that people might visit for leisure tend to be located. Severing features come in the form of major roads and railway lines, which are especially prevalent in the west of the Borough along the M25 corridor. In addition, ports and areas of heavy industry are also located along many parts of the River Thames, impeding access to and along the river corridor, which is part of the newly opened stretch of the England Coast Path between Tilbury and Southend-on-Sea [\[See reference 65\]](#).

4.44 Natural England's greenspace mapping provides information on the density of public rights of way (metres of route per km square; shown on **Figure 4.10**). This helps to highlight some key gaps in Thurrock's rights of way network:

- Purfleet, and connections to RSPB Rainham Marshes;
- South Ockendon and Aveley, and connections into and along the Mardyke Valley;
- Connections from West Thurrock to the Thames path (which is also poor quality in places); and
- Tilbury (other than around the fort) and a route around Tilbury Port for people walking along the Thames Path.

4.45 Provision of segregated cycle routes (likely to be used for commuting and leisure) is currently fragmented in Thurrock. There are short traffic free routes at Purfleet, Grays and Tilbury, and along part of the Mardyke, and some

segregated routes around Chafford Hundred. However, linking these together generally requires cycling on roads, which may discourage some cyclists.

4.46 A walking, cycling and horseriding assessment [\[See reference 66\]](#) produced as part of the Lower Thames Crossing (LTC) application identified the following priorities for the existing walking, cycling and horse riding network, within the vicinity of the LTC in Thurrock:

- A new cycle route between East Tilbury and Tilbury;
- Improved connectivity through the A13 junction; and
- Improved cycle accessibility to North Road and Dennis Road (South Ockendon).

4.47 Taking into account the effects of the LTC and need for mitigation, the following priorities were identified for the network with the LTC in operation:

- Muckingford Road: To provide better links from Linford and East Tilbury to Chadwell St Mary, anticipating future development and mitigating the severance caused by the Project.
- Stifford Clays Road: Incremental improvements to extend cycle routes between Orsett and William Edwards School – the nearest school.
- A1013 and Rectory Road: To re-provide and improve commuter cycle routes along A1013 between Stanford-le-Hope, Orsett and Little Thurrock and provide equestrian standard link across the A13.
- Fenland access: To provide better walking, cycling and horseriding access to the fenland and Mardyke by connecting existing rights of way and upgrading them to new shared-use tracks.
- North Road: To mitigate the severance of informal off-road routes between North and South Ockendon anticipating future development of the area and improved connections between North and South Ockendon.

4.48 Thurrock Council is actively working to improve provision for walking and cycling, with recently planned improvements to cycling facilities [\[See reference 67\]](#) [\[See reference 68\]](#). An Active Travel Strategy [\[See reference 69\]](#) has

also been prepared for Thurrock Council. The study carried out route analysis for walking and cycling. It also identified any gaps in provision, the potential of routes for greater use as well as their suitability for improvement. The Strategy focused on active travel to growth areas and key destinations, rather than for recreation.

4.49 The Strategy identifies a number of priorities for improvements to cycling and walking:

9. West/east connections across the borough: requiring new shared use paths between West Thurrock and Purfleet, and between Purfleet and Lakeside. Improvements to junctions and crossings. Walking route between Tilbury and Grays.
10. South Ockendon: new and improved shared use paths linking to Belhus Park, Belhus Woods Country Park, Lakeside, and train stations. Improved footpaths between Belhus Park and Aveley, and improved quality of route along Mardyke Valley.
11. Purfleet to Aveley: new shared use path along Sandy Lane into Aveley, and improved crossings and junctions. Improved footpath between Aveley and South Ockendon.
12. Stanford-le-Hope: new cycle lanes linking NCN13 to train station and retail centre. Improved connections to Corringham, East Tilbury and Coalhouse Fort.
13. Chadwell St Mary: new shared use paths along Brentwood Road and Heath Road, to link to Tilbury. Improved links to Little Thurrock / Blackshots.
14. Blackshots: Improved crossing at Little Thurrock and improved links to North Stifford, Little Thurrock and Chadwell St Mary.

15. Coastal routes: new shared use path between St Clements Road and Wouldham Road, convert path between Coalhouse Fort and Tilbury to shared use. Improved footpaths between Stanford-le-Hope, East Tilbury and Coalhouse fort. Connect Chafford Gorges to the Thames path. Tilbury to Grays footpath.

4.50 Building on the findings of the report, LUC has examined commuting desire lines to and from areas outside the Borough utilising the DataShine Commute tool [\[See reference 70\]](#). The following additional desire lines have been identified, which could be opportunities to create green corridors:

- Upminster – Purfleet.
- Rainham – Purfleet
- Stanford Le-Hope/Corringham – Tilbury.
- Stanford Le-Hope/Corringham – Purfleet.
- Tilbury – Grays.

4.51 The Lower Thames Crossing will impact upon some of these areas. The proposals indicate that key rights of way that cross the new motorway will be provided for with bridges, including some green bridges. However, the proximity to a busy road may discourage some walkers or cyclists. Traffic on other roads in the borough may also increase.

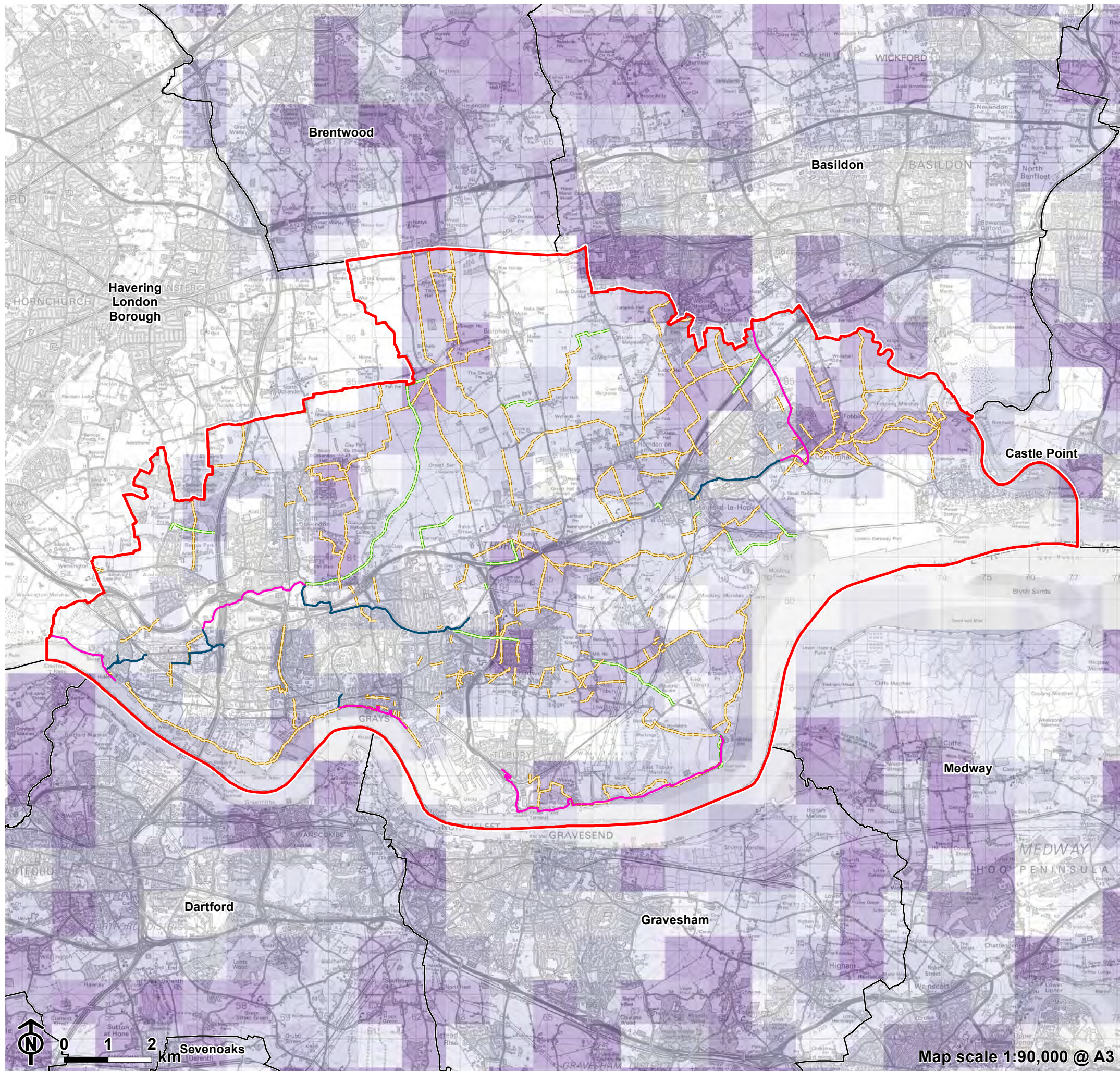
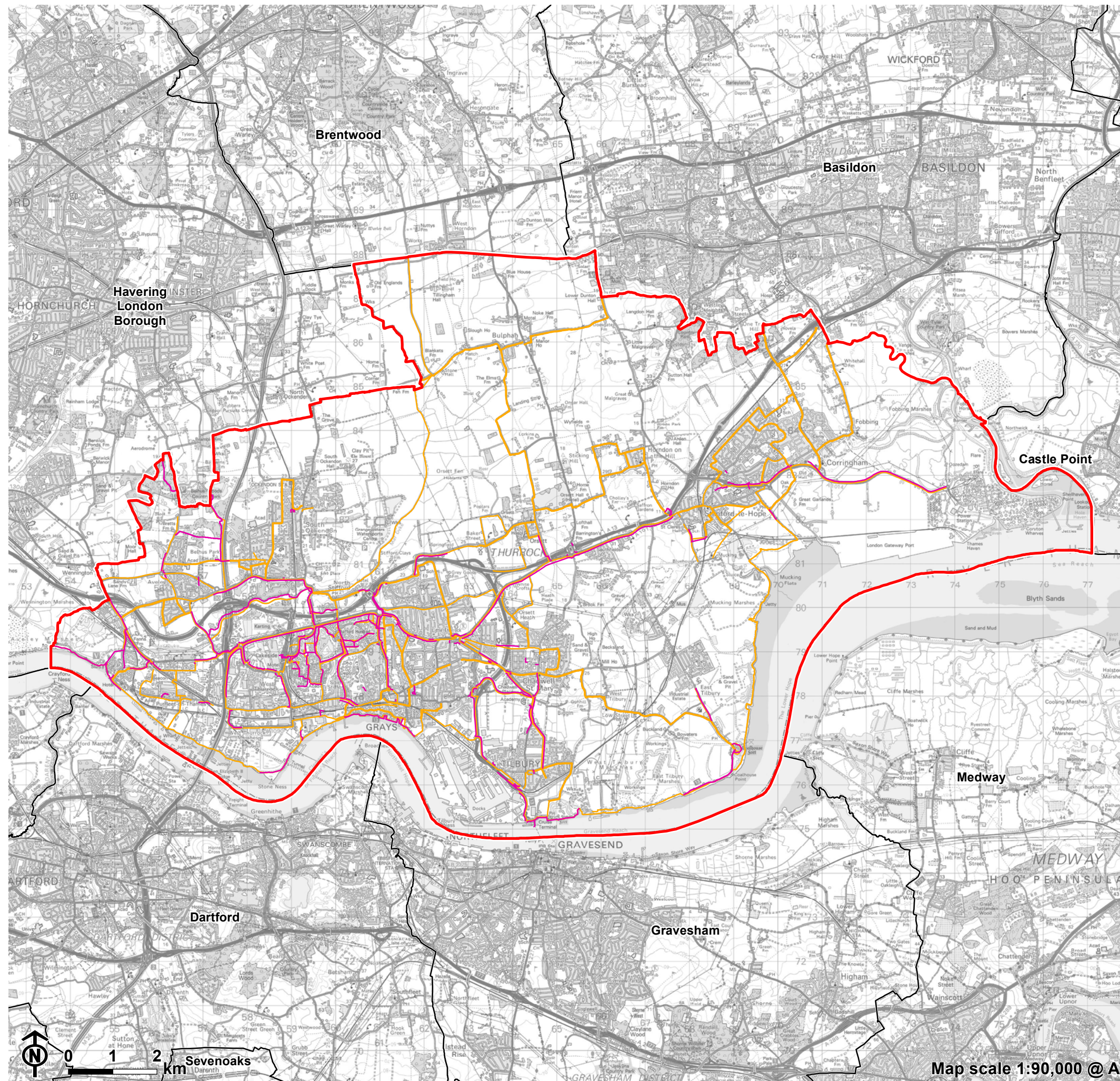


Figure 4.10: Public Rights of Way

- Thurrock Council boundary
- Neighbouring authority boundary
- National Cycle Network - only Thurrock**
 - LINK
 - NCN
- Public Right of Way - only Thurrock**
 - Bridleway
 - Footpath
- PRoW Density grid (m per 1km square)**
 - 0.00
 - 0.01 - 115
 - 115 - 525
 - 525 - 904
 - 904 - 1190
 - 1190 - 1545
 - 1545 - 1964
 - 1964 - 2458
 - 2458 - 3217
 - 3217 - 16609

**Figure 4.11: Cycle paths in
Thurrock**



- ▬ Thurrock Council boundary
- ▬ Neighbouring authority boundary
- ▬ Traffic free cycle route*
- ▬ Other cycle route*

*Note: Indicative Data - Data from
previous Thurrock project in 2016

Issues

- Off-road cycling and horse-riding provision is fragmented.
- The Public Rights of Way network has some significant gaps between settlements and to the wider countryside and lack a network that provides circular or longer routes for users.
- Stretches of Thurrock's rivers, the Mardyke and the Thames, form natural corridors for active travel, however some segments are inaccessible, hindering such movement.

Opportunities and needs

- Create and enhance a network of off-road cycle, pedestrian and horse-riding routes along key desire lines and main waterways. This includes improvements to the Thames Estuary Path and Sustrans Routes 13 and 137. These routes should be multifunctional, providing a recreational experience as well as connecting settlements.
- Identify and create links to areas of significant proposed development to promote active travel for commuting and recreation.

Blue infrastructure

4.52 Blue infrastructure (BI) refers to infrastructure relating to water. This includes water bodies themselves, and directly connected infrastructure such as flood defences. Thurrock contains a diverse range of BI.

4.53 **Figure 4.12** provides an overview of the surface water features that comprise the major elements of BI within the Borough. Smaller features such as sustainable drainage systems (SuDS), small ponds, and wet habitats such as reedbeds (see **Figure 4.6**) also contribute to the BI network.

4.54 There are two main rivers within the Borough: the Thames, which forms the southern Borough boundary, and the Mardyke which flows through the west of the Borough from north to south, meeting the Thames at Purfleet.

4.55 The water quality in the Mardyke and Thames is generally 'good' or 'moderate', in relation to ecological and chemical measures [\[See reference 71\]](#) assessed under the Water Framework Directive. However, there are some pollutants that are currently (based on 2019 data) at unacceptable levels:

- Mardyke: 'bad'/'poor' levels of dissolved oxygen and phosphates; and 'fail' in relation to levels of mercury, perfluorooctane sulphonate and polybrominated diphenyl ethers.
- Thames (middle): 'fail' in relation to levels of benzo(b)fluoranthene, benzo(g-h-i)perylene, mercury, perfluorooctane sulphonate, polybrominated diphenyl ethers and tributyltin.

4.56 The River Thames has been a key influence on both the physical and cultural development of Thurrock as a conduit for settlers, traders and invaders. It forms a distinctive landscape along the south of the Borough, with the river widening towards the east. The banks of the River Thames are punctuated by large creeks, notably Mucking Creek and Holehaven Creek. The water itself is dominated by large vessels docking at Tilbury Docks, London Gateway and Purfleet. The riverfront is characterised by industry alongside open marshland.

4.57 Thurrock Yacht Club near Grays is currently the only water-based leisure facility within the Borough, with a shore-side access via a slipway for boat parking, storage and maintenance at all states of the tide. A series of moorings are present on this stretch of the River. There is movement of leisure boats along Thurrock's waterfront, indicating that there could be demand for leisure moorings within the Borough. Thurrock's location, approximately 20 nautical miles downstream from the centre of London, creates a key opportunity for visitor and overnight moorings that cater to smaller vessels moving to and from the capital.

4.58 Tilbury Ferry terminal is the only pier in Thurrock to facilitate passenger movement across the Thames, with ferries running between Tilbury and Gravesend. There is currently no ferry service to other destinations along the Thames.

4.59 There are significant barriers to water-based recreation on the River Thames. This is due to a number of reasons including:

- Extensive intertidal mudflats, proximity of commercial port facilities and the ship wash created by passing vessels restricting leisure boating and other activities. Suitable spaces for water-based recreation here require significant infrastructure (e.g. slipways and breakwaters).
- The tidal nature of the Thames creates a significant restriction to leisure use, with strong tidal flows limiting opportunities for safe swimming and entry level water sports participation.

4.60 Demand for transporting commuters and visitors by water is increasing as the number of riverside destinations and services increase along the Thames. A recent Thames Clipper trial between central London and Gravesend is evidence of this. As the river becomes busier, further infrastructure will be required to support the expansion.

4.61 In addition to the rivers and creeks that run through the Borough, there are a number of lakes, the majority of which are flooded pits from former mineral extraction sites. Notable examples of these include:

- Lakes around South Ockendon, such as Grangewaters (water sports and outdoor education centre), Aveley Lake (fishing, with approval for watersports), and Lake Alexandria (fishing).
- Lakes at Belhus Country Park (fishing, wildlife).
- Lake at and north of Lakeside (watersports, diving, aquapark).
- Chafford Gorges Nature Reserve (fishing, wildlife).

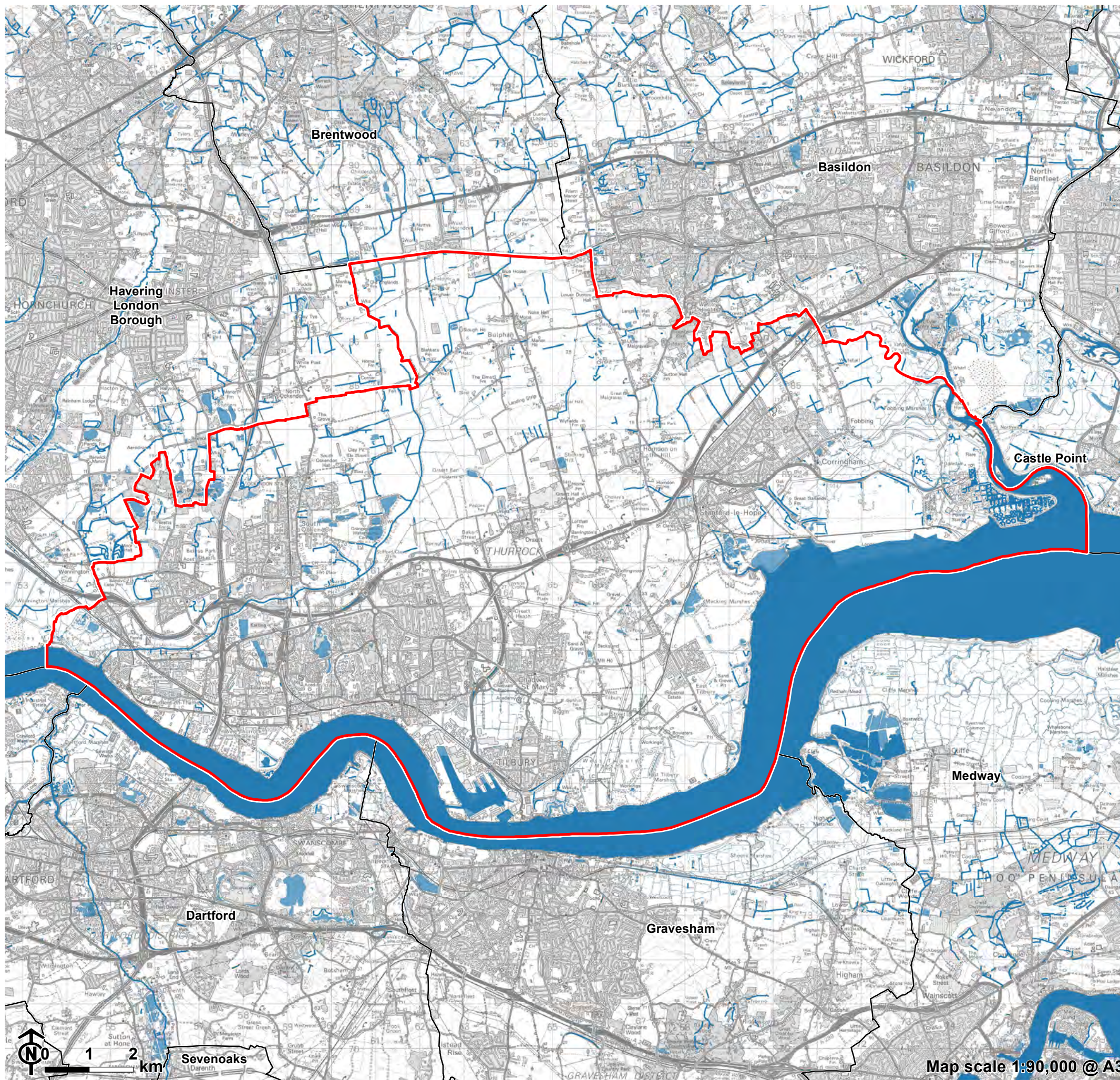
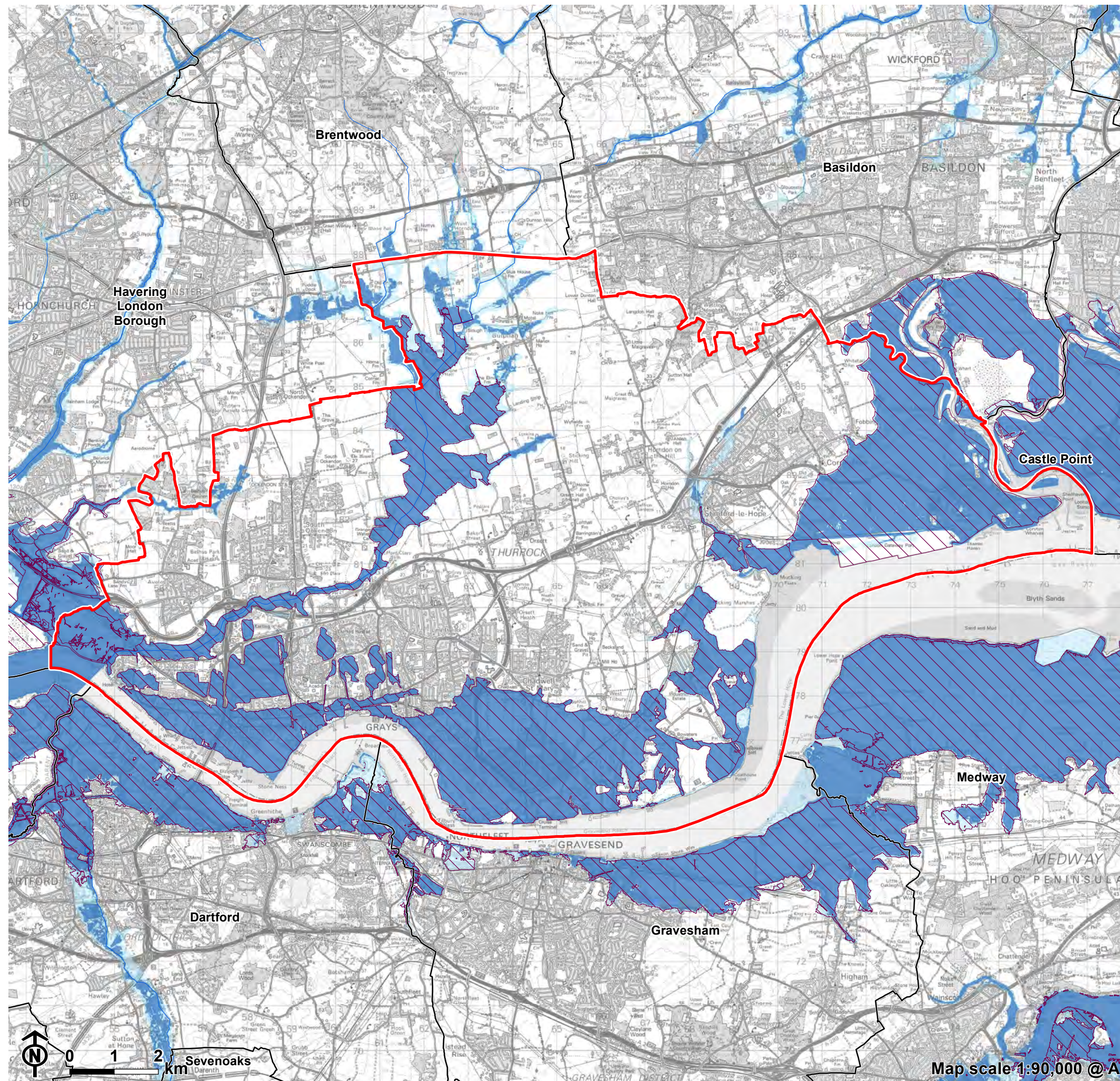


Figure 4.12: Blue Infrastructure

- Thurrock Council boundary
- Neighbouring authority boundary
- Blue Infrastructure network****
 - Surface Water
 - Rivers

****Note:**
The Blue Infrastructure data includes:
Rivers, Canals, Transitional, Coastal,
Lakes, Tidal and Surface Water.

Figure 4.13: Flooding



- Thurrock Council boundary
- Neighbouring authority boundary
- Area benefiting from flood defences
- Flood zone 2
- Flood zone 3
- River

4.62 Much of Thurrock is protected by flood defences, mainly in the form of raised, reinforced concrete walls, steel walls or earth embankments, most of which are maintained by the Environment Agency. **Figure 4.13** shows the extent of the Environment Agency (EA) flood defences in the Borough. Extensive tracts of flood defences are located along the River Mardyke and River Thames.

4.63 The primary flood defences within the Borough are the River Thames defences, which in Thurrock are mainly raised reinforced concrete walls, steel walls, or earth embankments which are recorded as providing protection from a 0.1% AEP (1 in 1000 year) tidal flood event. [\[See reference 72\]](#)

4.64 Along the River Mardyke there are approximately 10km of maintained channels, including the channels in close proximity to the Mardyke sluice and Stifford gauging station. These provide a standard of protection in the upper catchment to South Ockendon from a 5% AEP (1 in 20 year) fluvial flood event. In the lower catchment, between Purfleet and South Ockendon, defences largely offer a 0.1% (1 in 1000 year) standard of protection. Defences along the fluvial channel are maintained by the Environment Agency. [\[See reference 73\]](#)

4.65 Flood Barriers are further important flood infrastructure reducing the flood risk in Thurrock. There is a new flood gate at the entrance of Tilbury Docks. Fobbing Horse Flood Barrier controls water levels on Vange Creek and protects the surrounding area from a 0.1% AEP (1 in 1000 year) tidal flood event. Upriver of the Fobbing Horse Barrier are embankments along Vange Creek. [\[See reference 74\]](#)

4.66 The Lower Thames Crossing could impact upon flood zones for both the Thames and the River Mardyke; although the proposals include compensatory floodplain storage areas, intended to mitigate these risks.

4.67 Flood risk mitigation is crucial for Thurrock as it is particularly vulnerable to fluvial flooding from the tidal Thames Estuary south of the Borough and also the River Mardyke in the north of the Borough [\[See reference 75\]](#). This risk is

predicted to increase in the future, where from storm surges combined with high spring tides are projected to increase in frequency [\[See reference 76\]](#).

4.68 The Environment Agency has developed the Thames Estuary 2100 Plan [\[See reference 77\]](#) (TE2100) to recommend how to manage tidal flood risk to the end of the century and beyond. Within the TE2100 there are estuary-wide policies (Action zone 0) and four 'action zones' covering Thurrock:

- Action Zone 4- East London downstream of Thames Barrier (Rainham Marshes). States that "The river bed is accreting in front of the Thames defences. Not only does this mean that the defences are not threatened by erosion, but also that there may be environmental enhancement opportunities."
- Action Zone 5 – middle Estuary (Purfleet, Grays & Tilbury). States that "Drainage systems in the Purfleet, West Thurrock and Tilbury areas will require upgrading as the sea level rises and storm rainfall is expected to increase. Mitigation measures might include improved outfalls and drainage channels, additional pumping capacity, additional flood storage and new or improved local flood defences."
- Action Zone 6 lower Estuary Marshes (East Tilbury & Mucking Marshes). States that "It will be difficult to justify wholesale replacement of defences when they come to the end of their lives because of the low value of assets in this area. However, local secondary defences for important assets, and key infrastructure and residential areas such as East Tilbury may be a more appropriate solution. As the tidal flood defences will not be raised, flood risk will increase." and
- Action Zone 7 – lower Estuary, urban/industrial and marshland (Shell Haven & Fobbing Marshes). States that "It is recognised that flood defence improvements will be needed including defences for the critical infrastructure sites at Coryton. It will also be necessary to improve Fobbing Horse Barrier and associated defences as the barrier also protects Bowers Marshes. There is an opportunity to create an important green area on the marshes. This should include improved public access and amenity as well as habitat creation." In the adjacent Bower Marshes policy unit, TE2100

also recognises the risks of contamination from landfill (ie if flood defences are breached).

4.69 The Plan provides short term, medium term and long term actions up to 2100 for each zone. Actions concerning Thurrock include:

- Maintaining and enhancing defence walls (with improved access).
- Potential creation of new barrier across the Thames at Long Reach (across the Thames from Purfleet).
- Programme of habitat enhancement and creation at Tilbury Marshes and West Tilbury Marshes.
- Providing secondary defences for key assets such as East Tilbury.
- Enhance intertidal habits by setting back defences such as at East Tilbury and Mucking Marshes.
- Enhancing Fobbing Horse Barrier and improving drainage channels at Fobbing Marsh.

4.70 The Thames River Basin Management Plan [\[See reference 78\]](#) states that the priority issues to tackle in South Essex are pollution; poor water quality from urban and agricultural run-off; and physical modification due to urbanisation and flood protection. The Thames River Basin Management Plan (2015) and the South Essex Catchment Plan (2020) refer to a number of priorities and potential projects identified to address these issues, including:

- Restoration of the Mardyke, including completed invasive species removal.
- Restoration of Fobbing Marsh.
- Sustainable urban drainage systems.
- Invasive species identification, monitoring and eradication programme.
- Community engagement e.g. conservation days.
- Flood management using natural process and climate change adaptation, e.g. completed work at Davy Down.

- Promoting the removal of culverts and encourage development without culverts.
- Improving links to RSPB Purfleet, e.g. with access to the Mardyke Valley.

Issues

- The Thames Estuary and fenland along the Mardyke River corridor are at risk of flooding, which will increase with climate changes and sea level rise. This also contributes to coastal squeeze of estuarine habitats (see 'Biodiversity').
- There are significant barriers to water-based recreation on the River Thames within Thurrock, for example hard flood defences along the river, port activities and industrial land uses. The Thames Estuary path is therefore diverted inland in many places. Sections of the Mardyke are also inaccessible by bicycle and on foot (see also 'active transport').
- Many of Thurrock's waterbodies, such as the flooded gravel pits around South Ockendon, have limited biodiversity value, for example due to the absence of wetland marginal habitat (see also 'biodiversity').
- Parts of the Thames Estuary coast designated SPA/Ramsar are also sensitive to disturbance, where increased recreational use of paths could be detrimental to bird populations.
- There is only one ferry service from Thurrock (Tilbury to Gravesend) and few opportunities for mooring along the Thames; the tidal nature of the river restricts this.

Opportunities and needs

- Encourage nature-based solutions to flood risk, for example riparian planting, SuDS, and wetland creation.
- Enhance infrastructure (e.g. wharfs and piers) and develop a long-term strategy to enhance opportunities for river transportation. For example, there is an opportunity to develop an opportunistic approach to create moorings or small but centrally managed facilities for vessels to use,

reducing the transient nature of traffic through the Thurrock stretch of the Thames.

- Develop and facilitate improved access to and alongside the Thames Estuary and River Mardyke for walking and cyclists.
- Develop and expand opportunities for water-based recreation and improved biodiversity within Thurrock's waterbodies, such as lakes at Lakeside, Grangewaters and Belhus Country Park.
- Work with the Environment Agency to enhance flood defence infrastructure by adopting natural flood defences and increase the links alongside and to water spaces, as opposed to creating a hard buffer between blue and green zones.

Cross-boundary GBI

4.71 Looking at GBI across local authority boundaries is increasingly important. The highly influential Lawton review (2010) of England's wildlife sites highlighted the importance of creating bigger, better, more joined up spaces for nature to survive and thrive in the face of climate change and other demands on our land (see 'biodiversity loss', above).

4.72 More recently as part of the Environment Act 2021, the government has committed to establish Local Nature Recovery Strategies (LNRSs). LNRSs are a new, England-wide system of spatial strategies that will drive nature's recovery and provide wider environmental benefits. LNRS areas and "responsible bodies" to lead preparation of each LNRS are currently being agreed with Defra. The aim is to bring forward LNRSs before mandatory biodiversity net gain is introduced in November 2023. Each LNRS will, for the area that it covers: agree priorities for nature's recovery; map the most valuable existing areas for nature; and map specific proposals for creating or improving habitat for nature and for wider environmental goals (e.g. net zero carbon, flood risk reduction, water quality)

4.73 The production of each LNRS will be evidence based, locally led and collaborative, to help create a network of shared plans that public, private and voluntary sectors can all help to deliver. LNRSs are expected to be developed on a county scale, drawing on local data and expertise; Thurrock will be an active partner in the development of the Essex LNRS. The strategic opportunities identified in this GBI strategy should therefore be used to inform the larger scale LNRS.

4.74 This will be important as LNRSs will identify and incentivise the use of specific off-site Biodiversity Net Gain (BNG) locations (helping to secure BNG funding for projects) and they are also anticipated to be used to help target wider investment in habitat enhancement, such as the new environmental land management funding schemes for farmers/land managers.

4.75 Parts of the north-western areas of Thurrock (around the Mardyke Valley and Aveley) are within the Thames Chase Community Forest; a c.9,800 ha forest that extends to the London Boroughs' of Havering and Barking and Dagenham, as well as Brentwood and Thurrock in Essex. The forest is managed by the Thames Chase Trust, a partnership organisation that aims to:

- To protect, improve and expand the woodland character of the Community Forest;
- To sustain the natural integrity of the Community Forest's air, land and water including wildlife;
- To develop a connected network of links and accessible, vibrant greenspaces throughout the Community Forest;
- To integrate climate change adaptation and mitigation responses into the developing Community Forest;
- To use the Community Forest to improve local health and well-being, volunteering, learning and employment; and
- To enable effective partnership working from national to local level to maximise impact of available resources.

4.76 In order to identify cross-boundary strategic issues and opportunities, LUC has identified the key GBI assets within the neighbouring authorities (see **Figure 4.14**).

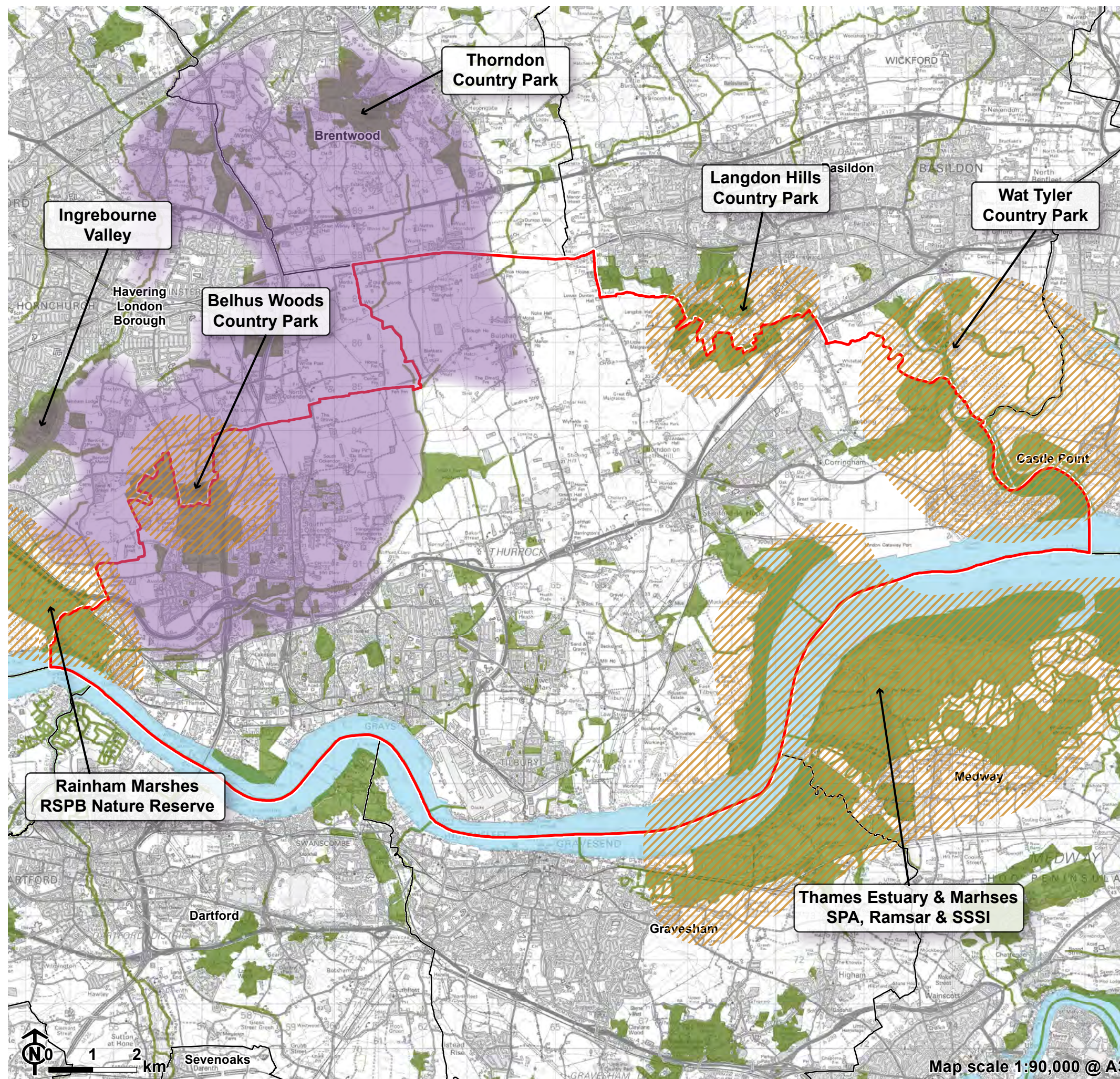


Figure 4.14: Cross Boundary Green Infrastructure

-  Thurrock Council boundary
-  Neighbouring authority boundary
-  Green infrastructure*
-  Cross boundary Green Infrastructure zone
-  Thames Chase Community Forest

*Note: Some Green Infrastructure data holds indicative Data - Data from previous Thurrock project in 2016

4.77 There are a number of notable assets that traverse, or are in close proximity, to the neighbouring authority boundaries including:

- Belhus Woods Country Park – located in Thurrock and the London Borough of Havering (and also within the Thames Chase Community Forest), Belhus Woods forms the heart of a group of sites in this area, including Cely Woods and Belhus Chase and Park. The country park contains ancient woodland, grassland and lakes, and acts as a recreational resource for a number of nearby settlements including Upminster, Rainham and Aveley.
- Rainham Marshes – an RSPB nature reserve located in Thurrock and the London Borough of Havering adjacent to the Thames Estuary. The area contains medieval marshes and is an important area for both wildlife and visitors. The majority of Rainham Marshes is covered by the Inner Thames Marshes SSSI.
- Thorndon Country Park – located approximately 2.5km north of Thurrock in the Borough of Brentwood. The Park is divided into Thorndon Park North, with the Countryside Centre, and Thorndon Park South. These areas are linked by the 'Old Park', which is owned by the Woodland Trust, and 'Old Thorndon Pasture', which is owned by Essex County Council. The most important habitat in Thorndon Country Park is the ancient deer park area dating back to the 15th century, which is designated as a SSSI.
- Langdon Hills Country Park – straddles the border between Thurrock and Basildon, the Park has ancient woodlands dating back to prehistoric times, with flower-rich grassland meadows and areas of dense scrubland. There are picnic areas and a good network of footpaths and horse and cycle tracks linking the surrounding countryside. The whole site and adjacent EWT nature reserves are part of the Langdon Ridge SSSI.
- Wat Tyler Country Park – located in the Borough of Basildon, the country park covers an area of 125 acres of habitats within the wider South Essex Marsh area (which includes the adjacent Fobbing Marshes, in Thurrock). Within the Country Park are the RSPB South Essex Wildlife Garden and South Essex Wildlife Garden and Visitor Centre.

- Thames Estuary and Marshes SPA, Ramsar site and SSSI –this site extends for around 15 km along the south side of the estuary, and also includes some intertidal areas on the north bank of the Thames in Thurrock. The area encompasses brackish, floodplain grazing marsh ditches and saline lagoons as well as intertidal saltmarsh and mudflat.

4.78 The South Essex Strategic Green and Blue Infrastructure Study [See reference 79] provides a vision for landscape infrastructure across South Essex. The Strategy identifies key areas of potential for GBI (**Figure 4.15**), which in Thurrock include the Mardyke Valley and connections north into the Brentwood Parklands and the marshland from Tilbury to the east.

4.79 A key part of the study's vision is the proposal of a South Essex Estuary Park (SEE Park), which makes use of the areas of key GBI opportunity (**Figure 4.16**). The SEE Park aims to connect the existing fragmented and severed landscape of South Essex, creating a mosaic of diverse green and blue infrastructure assets of approximately 24,000 hectares. This includes both restoration of individual sites and the improvement of GBI connectivity.

4.80 Thurrock's Mardyke Valley is envisioned in the strategy as one of five large-scale landscapes framing the SEE Park. Rainham Marshes along the Thames River, Thurrock and the Mardyke Valley, and Brentwood are all connected by this landscape. Initiatives to promote green travel, habitat creation, and connectivity with the Thames Chase Community Forest are already happening in the Mardyke Valley, but more may be done to expand this work. The aspiration for the Mardyke Valley is to provide a resource for current and future residents, as well as flood mitigation and wildlife and human connectivity.

4.81 Developing these proposals within Thurrock will require consideration of how access is managed in the sensitive landscapes and habitats of the marshes; and how the NSIPs could alter the landscape. This will be considered further as part of the next stage of the GBI strategy.

Figure 4.15 'Heat map' areas of GBI potential

(Image from South Essex Strategic GBI Strategy; reference 78)

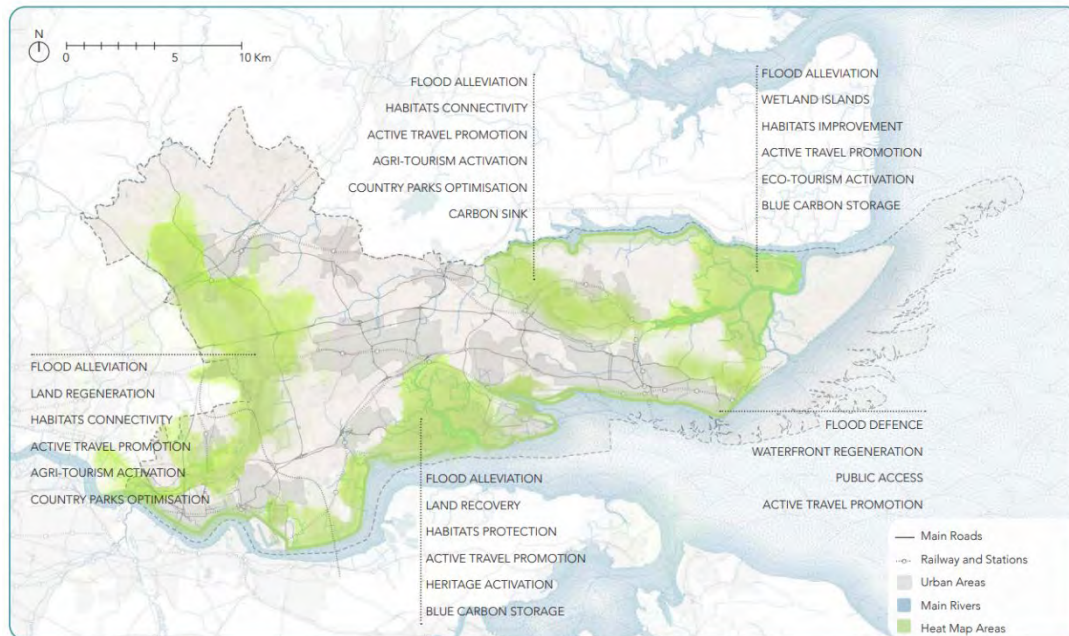
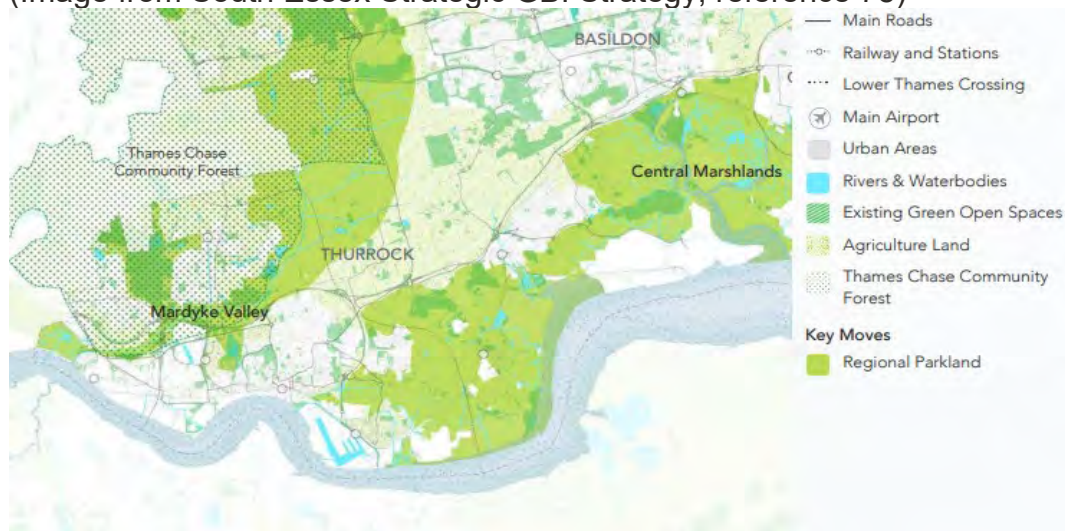


Figure 4.16: SEE Park overview for Thurrock

(Image from South Essex Strategic GBI Strategy; reference 78)



Issues

- Need for partnership working to improve sites and links to them near the Thurrock border.
- Limited cycling, pedestrian and horse-riding connections to some sites, e.g. from Thurrock into Rainham Marshes (particularly from Aveley) due to the presence of major roads; between South Ockendon and Aveley to Belhus Woods Country Park and Cely Woods; to Langdon Hills Country Park from Corringham; and between Thurrock and Wat Tyler Country Park.
- Areas to the west and south-west of Wat Tyler Country Park within Thurrock (Fobbing) exhibit similar landscape and biodiversity characteristics to the Country Park and could have improved access for recreation, but this would need to be sensitive to the ecological value of the marshes (e.g. adjacent SSSI designation, and use of some areas by SPA/Ramsar bird species, which are sensitive to disturbance).
- The Thames Estuary and marshes in Thurrock are part of the wider landscape of the estuary and marshes; and need to be considered as a whole in relation to biodiversity improvement, managing flood risk and climate changes, and improved recreation access; this is one of the principles behind the idea of the SEE Park proposed in the South Essex GI Strategy.
- There are fragmented areas of woodland, including some ancient woodland, on the border with Basildon (Langdon Ridge SSSI) and Havering (Belhus Woods and the Thames Chase Community Forest).

Opportunities and needs

- Consider long distance routes through the borough that link to GBI sites. Address gaps in those routes at the borough edge, for example improved cycle and pedestrian links to Langdon Hills Country Park, Rainham Marshes and Wat Tyler Country Park from adjacent settlements.

- Improve the biodiversity (and where appropriate the recreational value) of land around Fobbing Marsh, with improved ecological and recreational connectivity to Wat Tyler Country Park. Joint working to manage sites in Corringham and Fobbing Marshes, Wat Tyler Country Park and Bowers West Canvey Marshes.
- Expand areas of woodland around Langdon Ridge SSSI and within the Thames Chase Community Forest, to create more resilient habitats and accessible woodland. Use these to buffer and draw people away from sensitive areas, for example ancient woodland or parts of Langdon Ridge SSSI sensitive to visitor pressure.
- Continue to work with Thames Chase Trust to deliver projects identified within the Thames Chase Plan.

Chapter 5

Vision and Objectives

5.1 A vision and objectives set a framework within which GBI proposals can be identified and prioritised. The vision and objectives below were established in the draft GBI strategy and have been updated to reflect recent changes.

Vision

By the end of the Local Plan period, Thurrock will be an attractive riverside Borough, where people want to live, work and visit. It will have a multifunctional network of inter-connected green and blue infrastructure that encourages people to be active, allows wildlife to thrive, conserves distinctive landscapes and historic assets, and helps to mitigate and reduce the effects of climate change.

Objectives

5.2 The following objectives pull out some of the key areas for action required to achieve the Vision. Addressing climate change and the biodiversity crisis are of the highest priority and are threads that run through the other topics; there is therefore some overlap between objectives:

- **Objective 1: Health and wellbeing and access to nature:** Help residents to live healthy lives by improving air quality, improving inclusivity, enabling easy access to high-quality recreational opportunities in green spaces and improving the living environment of Thurrock.

- **Objective 2: Climate change mitigation:** Reduce Thurrock's carbon emissions by creating an extensive network of attractive routes for walking and cycling, to promote a modal shift away from motorised transport and promote land uses that increase carbon storage.
- **Objective 3: Climate change adaptation and flooding:** Prepare Thurrock for the current and future impacts of climate change by using green and blue infrastructure to build resilience through nature-based solutions to rising temperatures (e.g. shading in urban areas), increased flood risk and shifting habitat and species ranges.
- **Objective 4: Landscape, historic environment and sense of place:** Maintain, enhance and restore landscapes and townscape making attractive places to live, work and visit, enhancing settings of historic assets and positively managing potential adverse effects from new infrastructure.
- **Objective 5: Biodiversity:** Maintain and enhance Thurrock's biodiversity and maximise connections between biodiversity sites aiding nature recovery.
- **Objective 6: Green Belt:** Promote positive use of Thurrock's Green Belt by improving its multifunctionality and increasing opportunities for outdoor recreation and access to nature, especially where development occurs in or near Green Belt.

Chapter 6

GBI Projects

6.1 The issues, opportunities and needs identified in **Chapter 4** were considered together with mapping and a review of other documents and studies (see Bibliography in **Appendix A**), including the 2019 draft GBI Strategy.

6.2 From this, strategic areas of focus were identified, in which similar needs and opportunities occur. Within each strategic area of focus are more specific projects, which are described below.

6.3 Some of the strategic areas of focus apply to specific geographic areas, while others are dispersed throughout the borough (where the area of focus is an opportunity for a specific type of habitat or situation). There is some overlap and synergy between most of the areas of focus, but the groupings highlight key priorities for the borough.

6.4 The projects identified are designed as ‘place based interventions’ (a term used Green Infrastructure Framework (process journey for local authorities [[See reference 80](#)])). They have emerged from mapped data on assets and deficiencies. However, it should be noted however that opportunities to enhance the GBI network may not always be straightforwardly data-led. They may also be funding-led or created through identification of need by the local community or an interest group. Delivery partners should be open to, and supportive of, additional projects which emerge in this way – provided they align with the Vision and Strategic Objective set out in **Chapter 5**.

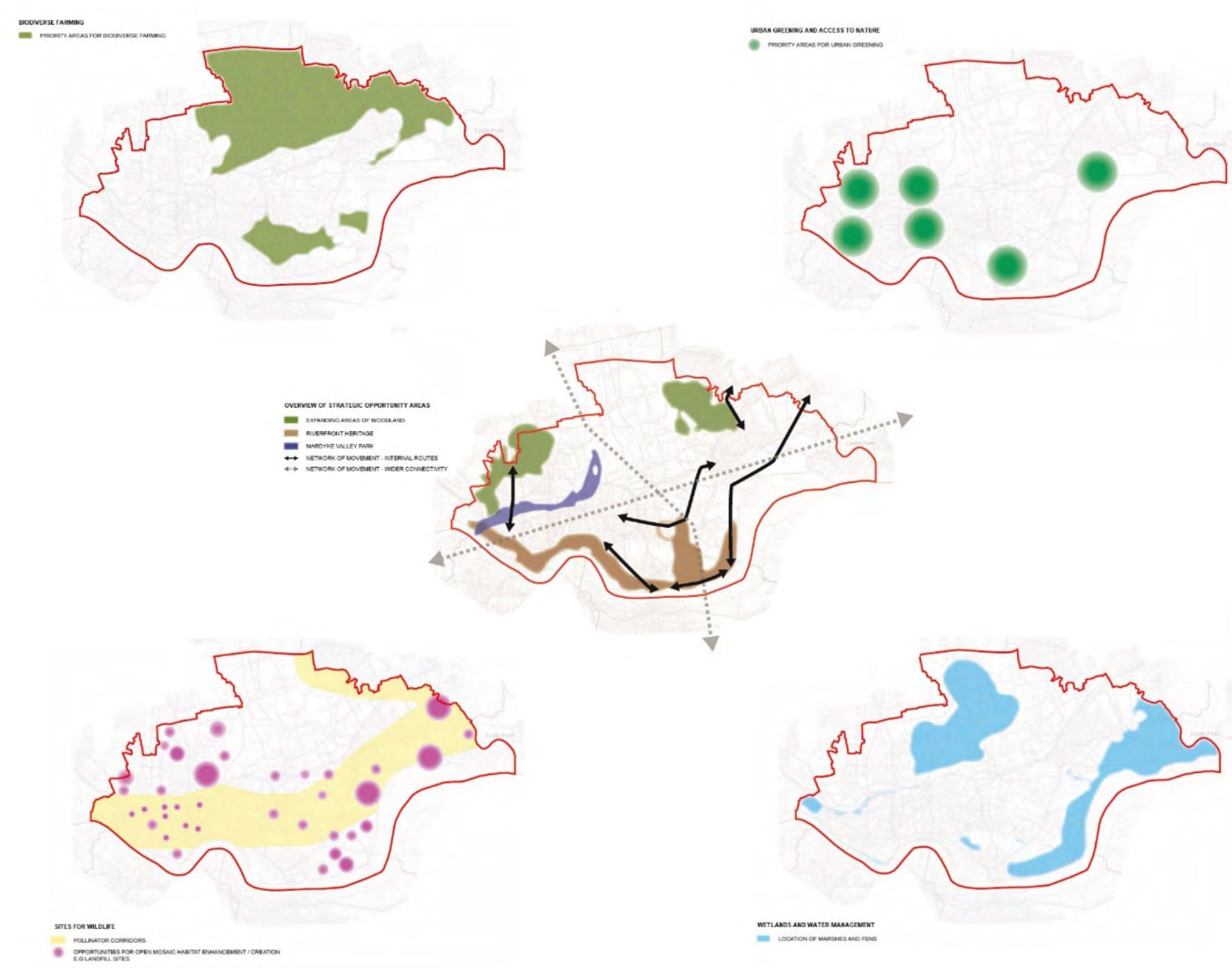
6.5 The strategic areas of focus are:

- Sites for wildlife;
- Expanding areas of woodland;
- Biodiverse farming;

- Wetlands and water management;
- Urban greening and access to nature;
- Riverfront heritage;
- Mardyke Valley Park; and
- A network for movement.

6.6 The relationship between these is shown on **Figure 6.1**.

Figure 6.1: Strategic areas of focus



Sites for wildlife

6.7 Support thriving biodiversity by protecting, enhancing and expanding undisturbed areas where wildlife can breed, nest and forage away from the influence of human activity.

The opportunity

6.8 Designated sites form the core of nature recovery networks. These sites need to be maintained in good ecological condition so that they can support their qualifying features. Focus for action is restoring SSSIs to favourable condition and reviewing Local Wildlife Sites to ensure they fulfil their role of supporting the upper echelon national sites. Crucial to success is management to ensure long-term ecological continuity. The Council can support this by contributing the development of the Essex Local Nature Recovery Strategy, and through Local Plan policies that contribute to the protection and enhancement of biodiversity and wildlife sites.

6.9 Maintaining and making space for nature should be underpinned by the principles of ‘bigger, better, more and joined up’. Sites for wildlife through Thurrock should be optimally complex and contain habitat mosaic/s that accommodate a strong diversity of terrestrial and aquatic habitats reflecting topography, geology and hydrology, that reduce fragmentation (by built development, disturbance, intensive management, etc) and successfully support rare and locally representative species.

6.10 Protected undisturbed sites for wildlife are especially important in Thurrock for woodland, open mosaic habitats on previously developed land, and wetlands. Thurrock’s existing sites for wildlife and priority areas for new sites for wildlife (‘B-line’ pollinator corridors, former landfill sites and open mosaic habitat) are shown on **Figure 6.2**.

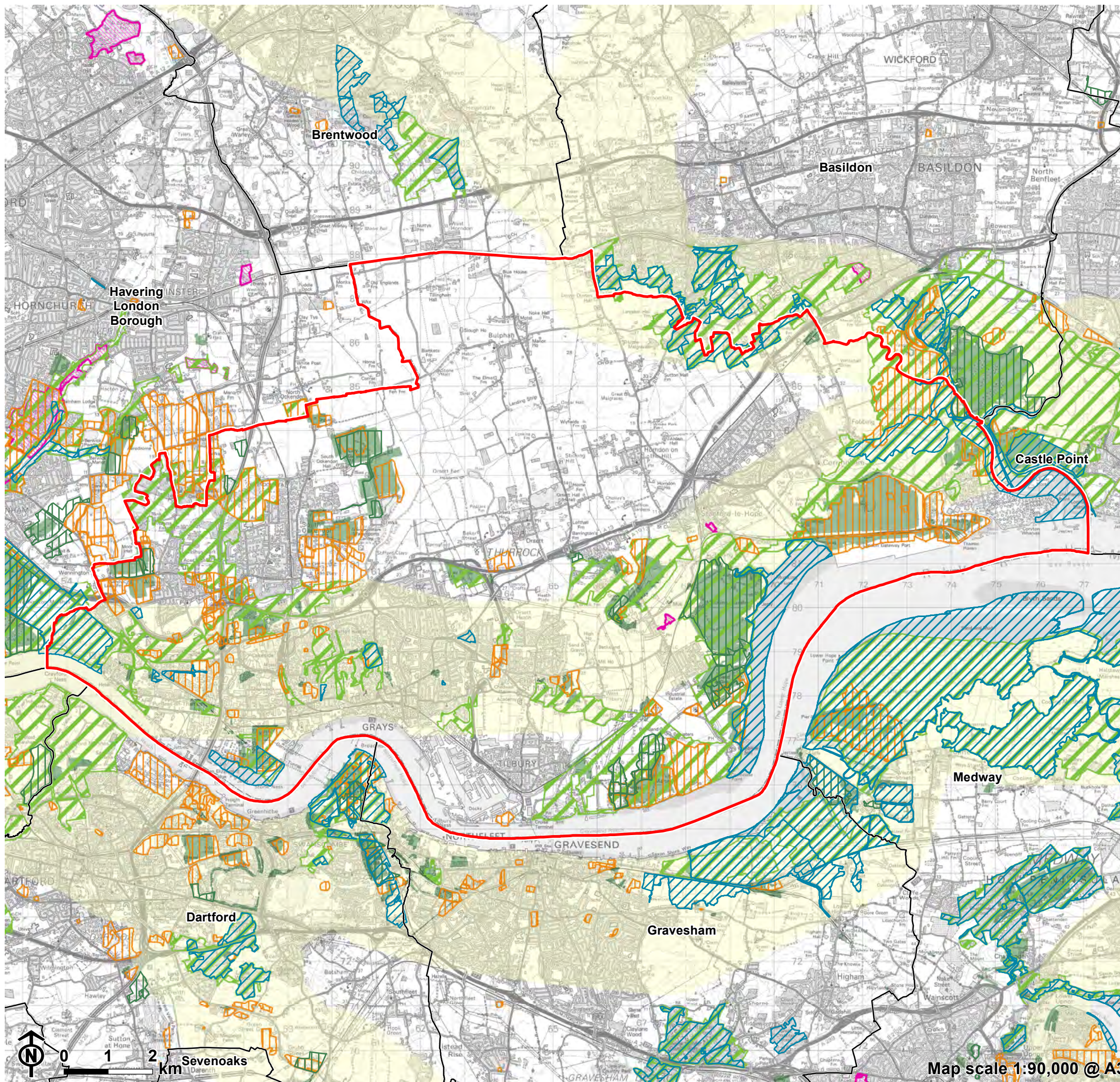


Figure 6.2: Sites for wildlife

- Thurrock Council boundary
- Neighbouring authority boundary
- Nationally and internationally designated sites for wildlife*
- Local Nature Reserve
- Open mosaic habitat
- Buglife - Thames Estuary IIA
- B-line
- Authorised landfill site
- Historic landfill site

* Includes SSSI, SPA, SAC and Ramsar

Woodland

6.11 Whilst recreational activities involving quiet enjoyment of the woodland, such as walking and cycling are unlikely to create direct disturbance, high general level of footfall throughout the year, including periods of significant use can result in a diverse range of impacts. In woodlands these can include, trampling/wear, leading to soil compaction, disturbance to invertebrates and ground-nesting or sensitive birds; spread of alien plants; and direct damage and vandalism of infrastructure. Noise, vibration and light disturbance can notably interfere with the foraging and flight paths for bat species. This is particularly an issue in ancient woodland as it takes hundreds of years to establish and is defined as an irreplaceable habitat. The largest cluster of ancient woodland in Thurrock is within Langdon Hills Country Park which is now part of Langdon Ridge SSSI (see **Figure 6.3** in 'expanding areas of woodland').

6.12 Actions to help create undisturbed sites for nature in woodland include creation of structural diversity including a diverse ground flora, creation of strips of scrub and grass mosaic both at the boundaries of wood and surrounding the glades and open spaces within the wood to soften the edge, and ensuring clearly defined walking routes. Areas of focus are the ancient woodland complexes at Langdon Hills/One Tree Hill complex in the north-east, and the Belhus Country Park/South Ockendon area in the west. For other opportunities see the 'Expanding woodland areas' strategic area of focus.

Open mosaic habitats

6.13 The Thames Gateway is home to assemblages of nationally important invertebrates often associated with Open Mosaic Habitat sites. These brownfield sites can be havens for wildlife and can support a huge range of species including the brown-banded carder bee and shrill carder bee. Much of the important wildlife in the Thames Gateway is associated with dry, flower-rich, open grasslands on nutrient-poor sands and gravel traditionally found in the

former Thames Terrace Grassland communities. Very little of this habitat remains, resulting in characteristic fauna being increasingly dependent on the network of open habitats that develop on brownfield sites. Areas such as former quarries (some of which are now operational or former landfill sites; see **Figure 6.2**) can replicate these habitat features.

6.14 Strategic focus is on developing larger wildlife-rich brownfield areas by protecting and expanding existing sites, notably those in the Buglife Thames Estuary Important Invertebrate Area (which encompasses the southern half of the borough), as well as the appropriate restoration of disused sites. Oliver Road Lagoons, formerly home to Thurrock Power Station, is arguably the best invertebrate site in Thurrock. Reducing the isolating of this site by creating physical and functional corridors to other brownfield sites is a priority. Incorporating suitable habitat into new developments through creative and innovative means, including for example, the use of brown roofs, should be considered to create additional functional connectivity.

Wetland

6.15 The Thames Estuary is a large coastal wetland and a vital migration hub for hundreds of thousands of wildfowl and wading birds (see also 'Wetlands and water management'). The Essex Coast Recreational Disturbance Avoidance & Mitigation Strategy acknowledges recreational pressure on the Thames Estuary and Marshes SPA and Ramsar, and identifies measures to manage visitor access, that would be funded by development. The strategy does not make use of Suitable Accessible Natural Greenspaces (SANGs), which can be used to reduce recreational pressure (more often used at non-coastal European sites). However there is an opportunity to provide alternative areas for recreation as part of the Local Plan, and this could help reduce visitor pressure at sensitive sites.

6.16 Managing and significantly restore areas of coastal grazing marsh and its associated habitats, including sea walls, reedbeds, ditches and saline lagoons will help support diversity of species. Re-linking fragmented habitats will create a robust wildlife network with enhanced adaptation to climate change (as well

as mitigation, as wetlands are a carbon sink; see ‘wetlands and water management’).

Alignment with Vision and Objectives:

6.17 The ‘sites for wildlife’ projects help to achieve the Vision by supporting the following objectives:

- Objective 2: Climate change mitigation – by increasing habitats that sequester carbon.
- Objective 5: Biodiversity – by protecting and enhancing habitats and sites.

Key partners

- Natural England
- Forestry England
- Environment Agency
- Essex Local Nature Partnership
- Essex Wildlife Trust
- RSPB
- The Land Trust
- Buglife
- Plantlife
- Thames Chase Community Forest
- Large landowners

Potential delivery mechanisms

- Biodiversity Net Gain
- Local Nature Recovery Strategy
- Environmental Land Management Schemes

Key risks and challenges

- Competing land use
- New development and associated infrastructure

Key ongoing projects

- Thames Chase Community Forest
- Fobbing Marsh restoration
- Buglife - Brownfield sites under threat
- LTC mitigation and enhancements along the route

Next steps

6.18 Engage with the Essex Local Nature Partnership to co-ordinate implementation of the Local Nature Recovery Strategy and identify core sites for wildlife.

Expanding areas of woodland

6.19 Expand and reconnect fragmented woodland, increasing the resilience of existing woodland, and make use of trees in adapting to climate changes.

The opportunity

6.20 Woodlands provide vital habitat for a range of species, carbon sequestration, a recreational resource, a source of forestry products, and can be part of a system of natural flood management. Thurrock has a varied landscape and woodlands are not appropriate in all parts of the borough, for example the marshes. However, many areas of the borough are suitable for woodland creation and enhancement.

6.21 There are important areas of existing deciduous and ancient woodland around South Ockendon and Aveley (within the Thames Chase Community Forest) and around the Langdon Hills. Woodland creation (through planting or changes to management that allow natural regeneration) can help to buffer and protect these areas and increase their resilience. Woodland and tree planting is also appropriate within farmland in the northern half of the borough, as field boundaries and small areas of woodland (see 'Biodiverse farming'); and in areas of fenland as riparian (riverbank) planting or wet woodland (see 'Wetlands and water management'). Tree planting may be delivered in rural areas by landowners or as part of new development. Growth areas in the borough are largely within or adjacent to existing settlements, so there is an opportunity to improve access to woodlands for current and future residents; as well as to incorporate trees more widely into the urban environment.

6.22 Thurrock's current areas of woodland and areas identified by Natural England for habitat restoration, enhancement or expansion are shown on **Figure 6.3**. Note that the habitat network opportunities mapping shows opportunities for all habitat types.

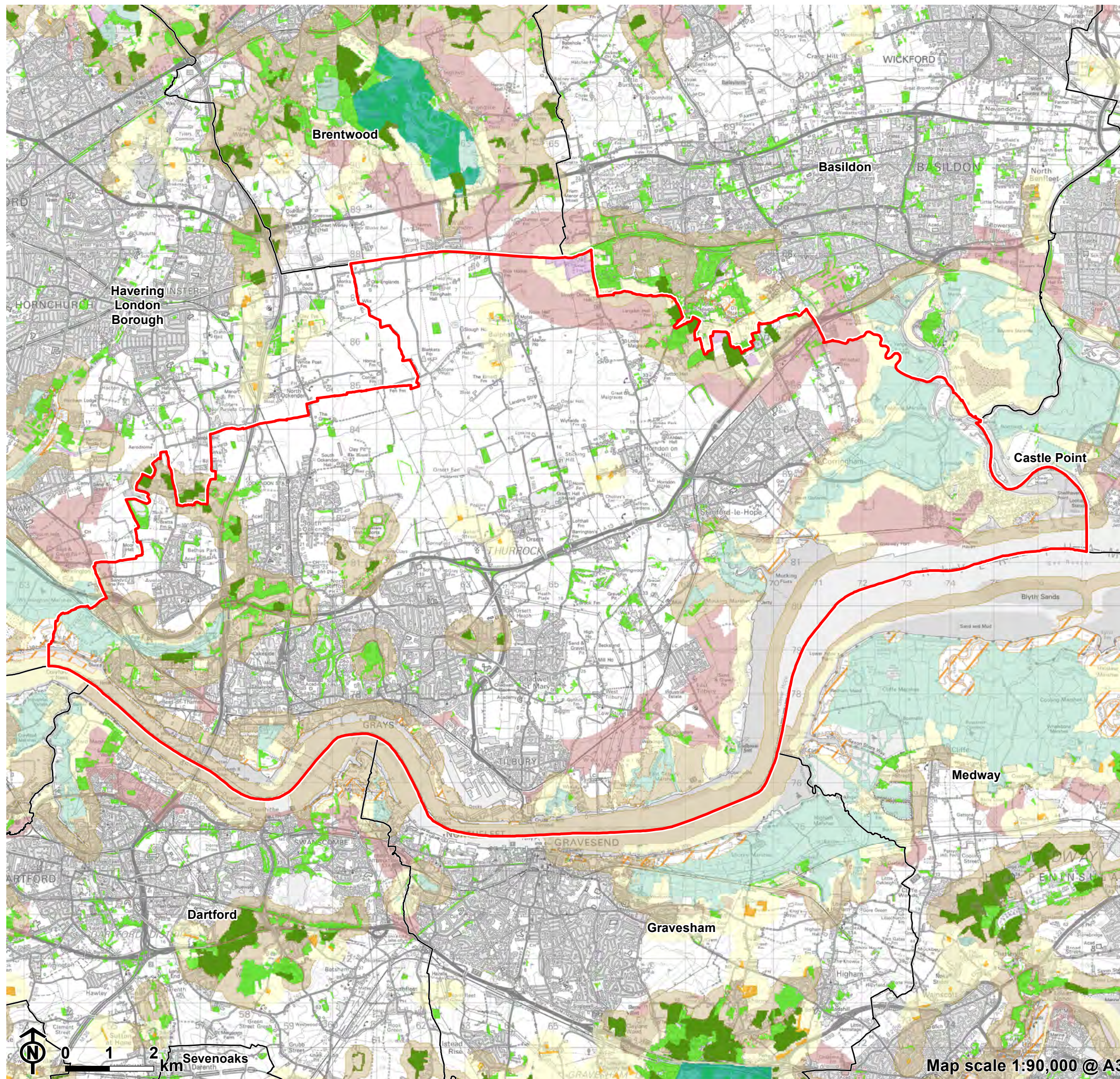


Figure 6.3: Expanding areas of woodland

- Thurrock Council boundary
- Neighbouring authority boundary
- Network opportunities**
 - Restorable Habitat
 - Habitat Restoration-Creation
 - Network Enhancement Zone 1
 - Network Enhancement Zone 2
 - Network Expansion Zone
 - Fragmentation Action Zone
- Priority Habitat Inventory**
 - Deciduous woodland
 - Ancient woodland
 - Traditional orchard
 - Wood pasture and parkland

Thames Chase Community Forest

6.23 The Thames Chase Community Forest currently includes much of the western part of Thurrock, including the areas around Aveley, South Ockendon, Bulphan and the Mardyke Valley. Thames Chase is currently reviewing its boundary. It is likely that it will be extended to include the former Land of the Fanns boundary which extended to the Langdon Hills in 2023.

6.24 Aspirations for the creation and enhancement of the Thames Chase Community Forest are set out in the Thames Chase Plan, with many of the objectives in the plan already achieved or underway since the most recent Plan was prepared in 2014, for example tree planting around Aveley and within school grounds.

6.25 Thurrock Local Plan can support the work of the Thames Chase Trust to protect, expand and enhance woodland habitats in Thurrock, by requiring all major development (e.g. ten or more homes or a site of more than 0.5ha) within or adjacent to the Thames Chase Community Forest to demonstrate how it will increase woodland habitats and the accessibility of woodlands on or off site.

6.26 In the Thames Chase Community Forest, suitable habitats could include broadleaved woodland; wood pasture and parkland; coppiced woodland; hedges and tree belts around farmland as well as grassland and wetlands. This mosaic of habitats benefits biodiversity and provides a variety of experience for people visiting the forest.

6.27 Within the Thames Chase area, new development should be required to achieve a higher proportion of its biodiversity net gain from woodland habitats than in other areas; with priority given to connected woodland (tree lines and clusters of trees) rather than individual trees, where possible. On areas of former minerals extraction or landfill that have been remediated, it may be appropriate to leave open areas to benefit invertebrates, as part of a mosaic of habitats (see 'Sites for wildlife').

6.28 Where new development requires land to be removed from Green Belt designation, compensatory improvements could include new woodland planting and/or improved accessibility to woodland in surrounding Green Belt. Forest creation in this area would also support other GBI priorities for example Mardyke Valley Park and connections into it.

Trees in urban areas

6.29 The urban areas within Thurrock have some significant areas of woodland within them, such as Chafford Gorges Nature Park and Grays Thurrock Chalk Pit SSSI (which can be seen as existing woodland on **Figure 6.3**). However, tree canopy cover from street trees varies (see also **Figure 6.8** in ‘urban greening and access to nature’), with some areas having very few trees. Street trees bring a number of benefits including shade, improved air quality, biodiversity, and are visually appealing. **Figure 6.4** illustrates some of the benefits of urban trees.

6.30 There are opportunities to increase canopy cover from trees in urban areas through planting as part of new development but also on council owned or maintained assets e.g. streets and parks (see ‘Urban greening and access to nature’).

6.31 The Thames Chase Community Forest has partnered with the London Urban Forest Partnership, to work to increase canopy cover within London by 10% by 2050. The London Urban Forest Plan (2020) sets out actions required to achieve the goals (among others) of increasing the number of trees on streets and in parks, particularly in areas of low canopy cover. These include making use of data on canopy cover and vacant tree pits, to prioritise areas for tree planting. Thurrock could adopt similar principles and also prepare a local urban forest plan.

Figure 6.4: Benefits of trees in urban areas



Alignment with Vision and Objectives:

6.32 The ‘expanding areas of woodland’ projects help to achieve the Vision by supporting the following objectives:

- Objective 1: Health and wellbeing and access to nature – by increasing shade and filtering air pollution, and by increasing accessible woodland.
- Objective 2: Climate change mitigation – by increasing habitats that sequester carbon.
- Objective 3: Climate change adaptation and flooding – by providing shade in urban areas and reducing urban temperatures.
- Objective 4: Landscape, historic environment and sense of place – by increasing the resilience of ancient woodland and restoring historically wooded landscapes.
- Objective 5: Biodiversity – by increasing biodiversity in urban areas.
- Objective 6: Green Belt – by improving access to nature in Green Belt.

Key partners

- Thames Chase Community Forest
- Forestry England
- Woodland Trust
- Landowners
- Neighbourhood planning groups (esp. rural settlements)
- National Highways, as part of Lower Thames Crossing mitigation and compensation

Potential delivery mechanisms

- Policies to protect valuable areas of existing woodland and to require woodland creation as part of new development.
- Delivered via new development, especially in growth locations. Either on site planting or compensatory improvements to Green Belt, where development has involved the release of land from Green Belt designation. Potential areas of Green Belt release around settlements are an opportunity to increase accessibility of remaining woodland or plant new woodland as compensatory measure, e.g. community orchards.
- Biodiversity Net Gain requirements.
- English Woodland Grant Scheme Development.
- Woodland carbon code to generate carbon offsetting credits through woodland planting.
- Funds available for environmental land management: Sustainable Farming Initiative, Local Nature Recovery, and Landscape Recovery schemes.
- Funds available for tree planting: England Woodland Creation Offer, Urban Tree Challenge Fund, and Local Authority Treescapes Fund.
- LTC designated funds.

Key risks and challenges

- Challenge of ‘retrofitting’ trees into urban area;
- Multiple landowners

Key ongoing projects

- Thames Chase Community Forest, e.g. Aveley Forest
- Ongoing management of woodland sites (Forestry England, Woodland Trust etc)

- LTC mitigation and compensation including for loss of ancient woodland along the route

Next steps

6.33 Develop Local Plan policies that support woodland expansion, both within urban areas and within rural areas; for example as part of greenfield development, biodiversity and access improvements, or infrastructure upgrades.

6.34 Continue to work in partnership with the Thames Chase Trust to deliver projects within the Thames Chase Community Forest.

Biodiverse farming

6.35 Create a productive landscape with biodiverse habitats and corridors to facilitate species movement.

The opportunity

6.36 Permeable landscapes are needed to maintain ecological processes, genetic diversity, potential for communities and populations of species to adapt as the climate and land use change. Biodiverse farming practices (part of the broader idea of ‘regenerative farming’), includes measures such as leaving species-rich arable margins and hedgerows, creating ponds, ditches and scrapes, planting trees and growing a diversity of crops in diverse rotations can create rich, low-chemical habitats where biodiversity can thrive.

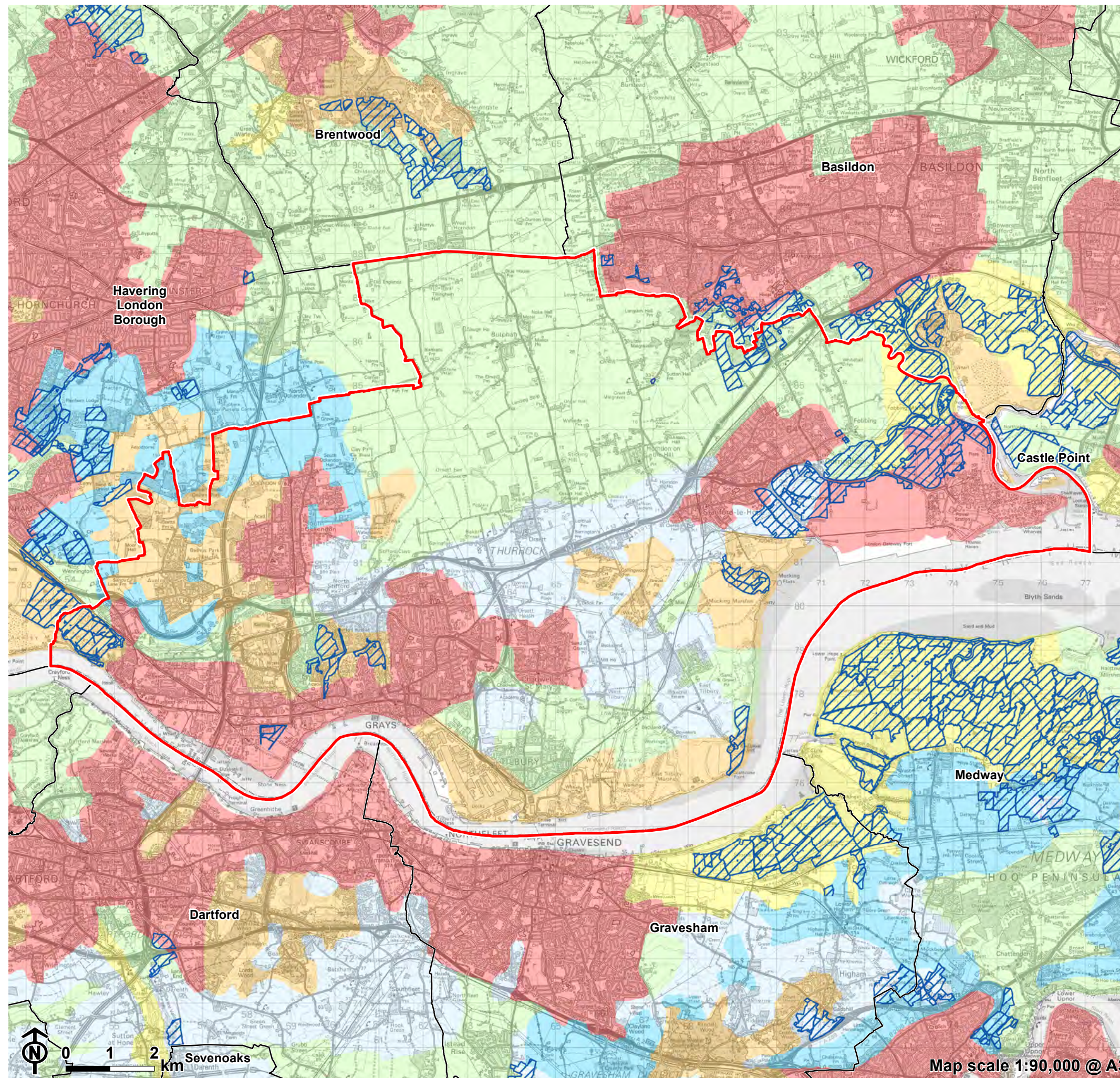
6.37 These practices can benefit farmers as well as biodiversity: working with nature can help building soil fertility through composting and crop rotation; and using legumes to fix nitrogen, rather than synthetic fertilisers and also make soil more resilient to erosion. This will become more important as the climate changes.

6.38 Significant areas of the north and centre of Thurrock are farmed and are Grade 2 (very good) and grade 3 (good to moderate) agricultural land. These areas are largely devoid of Local Wildlife Sites with little priority habitat other than small, fragmented blocks of woodland. Around Langdon Hills, there are larger blocks of woodland, including some ancient woodland; but where woodland exists elsewhere in the farmed landscape it is small and very fragmented. There are some small areas of traditional orchards around the rural settlements of Bulphan, Orsett and Horndon.

6.39 Only a small proportion of the borough's agricultural land is under a stewardship agreement (as shown on **Figure 6.5**). Stewardship agreements provide financial incentives for land owners and managers to protect and improve the environment; therefore the area of land under these should be increased. The Council can support this through the Local Nature Recovery Strategy process.

6.40 Areas with Thurrock's best agricultural land (Grade 1-3) and existing stewardship agreements are shown on **Figure 6.5**. By comparing this with **Figure 6.2**, **6.3** and **6.6**, it can be seen that much of the borough's agricultural land is within or close to areas important for wildlife (e.g. marshes), woodland expansion (e.g. around Langdon Hills), and/or water management (e.g. fenland); therefore there are synergies between 'biodiverse farming' and the creation of 'sites for wildlife', 'expanding areas of woodland', and 'wetlands and water management'.

Figure 6.5: Biodiverse farming



- Thurrock Council boundary
- Neighbouring authority boundary
- Stewardship agreement
- Agricultural Land Classification**
- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Non Agricultural
- Urban

Trees and hedgerows

6.41 While it is important to retain valuable agricultural land, broadleaved tree and hedge planting (see 'Expanding areas of woodland') should be encouraged within rural areas that:

- Connects and buffers existing areas of woodland;
- Provides tree lines and hedgerows around field and settlement boundaries;
- Reinforces pre-18th century enclosure patterns and tree lined lanes around Langdon Hills; and/or
- Is accessible to the public, providing a recreational resource close to where people live, and drawing people away from areas that are sensitive to recreation pressure (e.g. Langdon Ridge SSSI).

6.42 Priority areas for tree planting within farmland are around the Langdon Hills; and in the area broadly between Orsett and Fobbing, where new woodland could help to connect fragmented woodland, provide accessible woodland, and provide a buffer for air pollution along the A13 road corridor (which is likely to receive more traffic if the Lower Thames Crossing is built).

6.43 New areas of traditional orchard would also be welcomed within or close to rural settlements (see also 'Urban greening and access to nature'); and riparian planting is appropriate in fenland areas e.g. around Bulphan (see 'Wetlands and water management').

Grassland and grazing

6.44 A complex landscape with woods, grasslands, hedgerows and arable fields will better support Brown Hares, pollinators and important populations of breeding birds, notably dark-bellied Brent geese. Areas of tall grassland should

favour nesting Skylarks and could also benefit a number of key insect species that are also severely impeded by intensive grassland cutting.

6.45 Grazing is also especially important in shaping and maintaining the ecology of Thurrock. Wet grasslands and grazing marsh (e.g. at Tilbury Marshes) provide very valuable habitat for breeding and over-wintering birds. Decline in traditional management has led to a loss of this habitat type and the high diversity of native plant species it supports. This is most notably because of removal of grazing stock that trample the edge of ditches, or overgrazing. Maintaining light grazing will recreate varied wetland-grassland habitat mosaics.

Alignment with Vision and Objectives:

6.46 The ‘biodiverse farming’ project helps to achieve the Vision by supporting the following objectives:

- Objective 3: Climate change adaptation and flooding – by increasing biodiversity and therefore the resilience of habitats and species to change.
- Objective 5: Biodiversity – by reducing grazing pressure on valued habitat and increasing the diversity of habitats within agricultural land.

Key partners

- Private landowners
- CPRE Essex
- FWAG South East
- RSPB
- Natural England
- Environment Agency
- Essex and Suffolk Water

Potential delivery mechanisms

- Funds available for environmental land management: Sustainable Farming Initiative, Local Nature Recovery, and Landscape Recovery schemes.
- Funds available for tree planting: England Woodland Creation Offer.

Key risks and challenges

- Climate change driving more intensive and extensive production as drier and warmer summers impact crop yields.
- Willingness of farmers to keep livestock on rotation to maintain species rich grassland.
- Perception of lost profits from reducing area of productive land by leaving space for nature.
- Uncertainty over emerging policy context and implementation of Environmental Land Management Schemes

Key ongoing projects

- Natural England's Catchment Sensitive Farming
- Certification schemes e.g. RSPB 'Fair to Nature'
- Fobbing Marshes grazing initiatives (sheep and cattle) to restore coastal grazing marsh.

Next steps

6.47 Identify, engage and where possible map, the landowners in Thurrock most willing to make biodiversity enhancements on their land. This will help to identify where these land holdings overlap with priorities for the GBI Network. Wider outreach with landowners to enable changes to 'business as usual'.

6.48 Engage with the Essex Local Nature Partnership to co-ordinate implementation of the Local Nature Recovery Strategy.

Wetlands and water management

6.49 Restoration of Thurrock's major river corridors and associated tributaries and wetlands as multi-functional nature-rich blue-green corridors that provide nature-based solutions to flood risk.

The opportunity

6.50 Thurrock's rivers and wetlands form an important anchor for the wider green infrastructure network. However, significant concerns over future flood risk and ongoing river quality issues mean that over the course of the Local Plan period there needs to be a dramatic transformation over how these 'blue corridors' are managed and improve their natural capital value, especially as new development comes forward.

6.51 The River Thames has been a key influence on both the physical and cultural development of Thurrock (see also 'Riverfront heritage'). It forms a distinctive landscape along the south of the Borough, with the river widening towards the east. The banks of the River Thames are punctuated by large creeks, notably Mucking Creek and Holehaven Creek. The River Mardyke, Mucking Creek and Holehaven Creek are tributaries of the tidal River Thames. Each river can be thought of as its own system but also part of the wider Thames catchment.

6.52 Planning for GBI across the borough presents an opportunity to implement natural flood management at a catchment scale (effectively large-scale SuDS), including watercourses and coastal areas.

6.53 Flood risk mitigation is crucial for Thurrock as it is particularly vulnerable to fluvial flooding from the tidal Thames Estuary south of the Borough and also the River Mardyke in the north of the Borough. This risk is predicted to increase in

the future, where storm surges combined with high spring tides are projected to increase in frequency.

6.54 Environment Agency Flood Defence Infrastructure Work aims to enhance spatial flood defences with particular attention to enhancing biodiversity and increasing links or access to water, as opposed to creating a hard buffer between blue and green zones. The South Essex Catchment Flood Plan has also identified the need for flood storage studies, which will identify areas for strategic GBI, for example upstream of Stanford-le-Hope. Key to this project will be delivering the actions within the TE2100 Plan and emerging flood storage studies, as well as maximising the multi-functionality of flood defences provided as part of the Lower Thames Crossing. The Local Plan can support the TE2100 Plan and emerging flood storage plans, by safeguarding floodplains and areas required for nature-based flood solutions within its Infrastructure Delivery Plan. Policies should seek to maintain safe public access and amenity within floodplains, and minimise development.

6.55 Thurrock's existing watercourses and wetland habitat are shown on **Figure 6.6**, along with opportunities areas for nature-based flood management (Environment Agency's 'Working With Natural Processes' data) and pond creation (great crested newt opportunity areas).

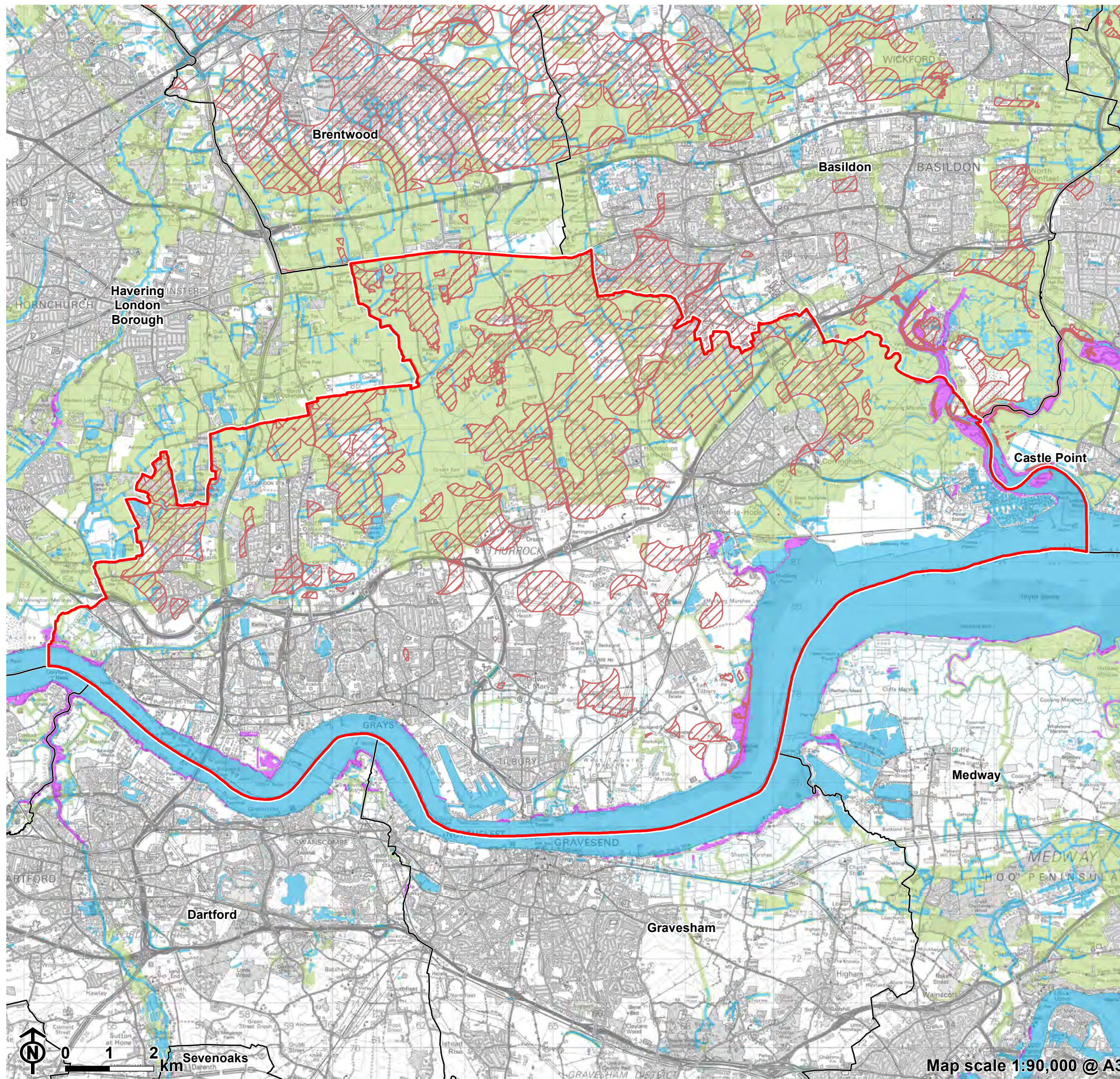


Figure 6.6: Wetlands and water management

- Thurrock Council boundary
- Neighbouring authority boundary
- Existing wetland habitat (PHI)
- Great Crested Newt Strategic Opportunity Area
- EA Working With Natural Processes potential
- Surface Water
- River

Estuary restoration and habitat creation

6.56 Estuary habitats play an important role in flood management and carbon storage, as well as biodiversity (see ‘Sites for wildlife’). Local Plan policies should therefore seek to protect estuarine habitats and to protect and re-establish saltmarsh.

6.57 Priority areas for this are around Tilbury and Mucking, for example:

- Tilbury Marshes and West Tilbury Marshes: this area will be at increased risk of flooding in the future, providing an opportunity for enhancement of intertidal habitats;
- Long Reach to Northfleet Hope: the Landscape Character Assessment identified that this area could become a living and vibrant stretch of the River Thames but with naturalistic mudflats and marshes that form part of a multi-functional system of river, marshland and estuary. Well-managed to balance the needs of a thriving industry and local economy as well as providing important green infrastructure including public access, wildlife and education.

Fenland riparian planting and pond creation

6.58 In the upper reaches of the Mardyke River and Fobbing Creek, and reflected in the place names around those watercourses, are areas of fenland characterised by low lying farmland with drainage ditches and streams.

6.59 Although fen landscapes are more open and less wooded than other areas of farmland in the borough, tree planting can be appropriate along the banks of watercourses (‘riparian planting’). Wet woodland such as this can play an important role in water management: filtering pollutants and slowing the flow of water, reducing flooding.

6.60 Opportunities for riparian woodland planting should be sought in the upper reaches of watercourses; for example along the Mardyke and ditches near Orsett and Bulphan, and in the fenland around Stanford-le-Hope and Corringham. This could involve converting arable land to woodland and grassland in the mid and upper catchments to stabilise soils, reduce sediment and nutrient run-off and improve flood management. Woodland creation and vegetation planting also help manage sediment and diffuse phosphate pollution. There are high levels of phosphates within the Mardyke so a shift to less intensive agriculture and nutrient neutral development should be encouraged.

6.61 Fenland within the borough have also been identified by Natural England as priority areas for great crested newt habitat enhancement (see **Figure 6.6**), ie pond creation and management. This is compatible with riparian planting as newts make use of ponds within a variety of habitats. Fenland riparian planting and pond creation can therefore be part of generally increasing the diversity of habitats near rivers and ditches in the fens, with benefits for both biodiversity and flood management.

SuDS in new developments

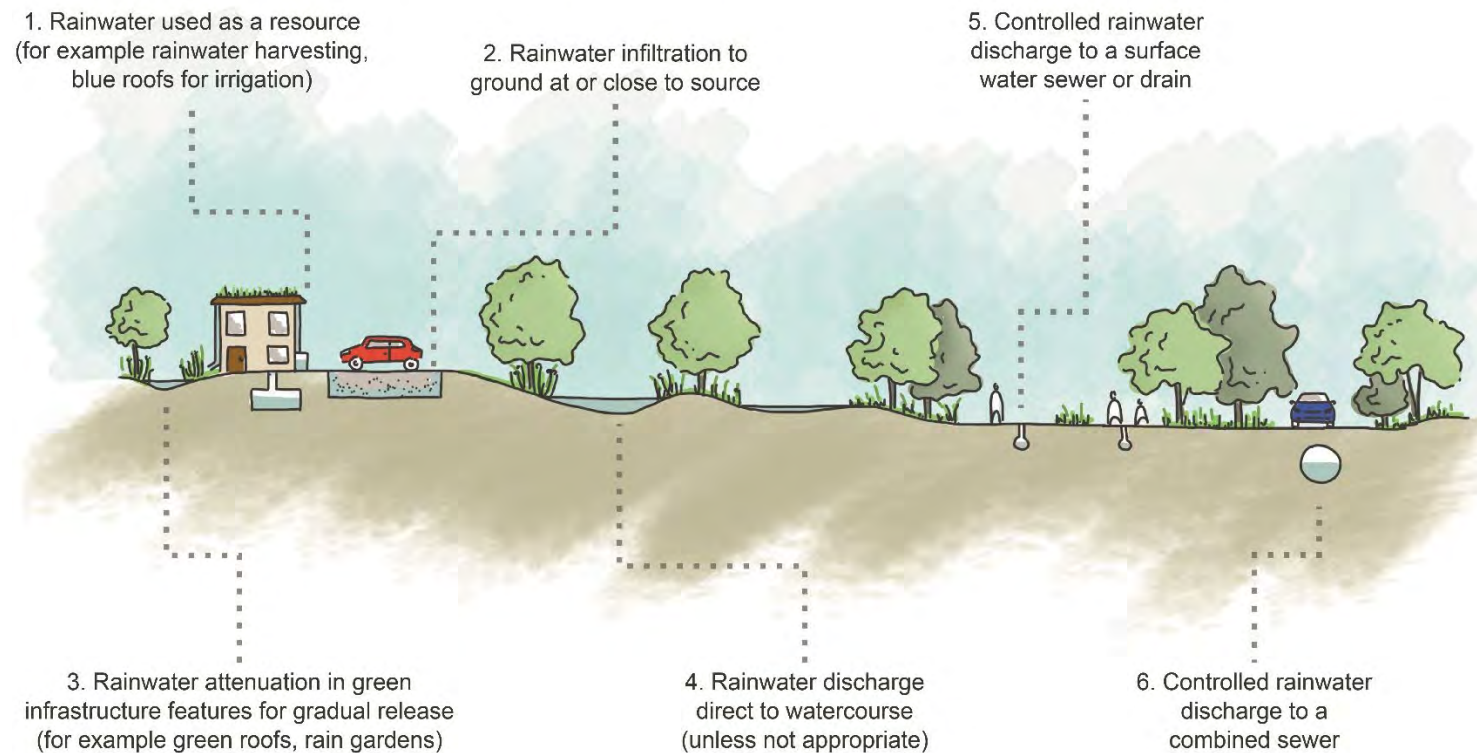
6.62 Sustainable drainage systems (SuDS) make use of natural processes to manage water to reduce flooding, improve water quality, and reduce the need for irrigation of trees and greenspaces. **Figure 6.7** illustrates the drainage hierarchy, showing that water re-use and SuDS are preferable to discharge into sewers.

6.63 Small-scale SuDS measures such as green roofs, green facades, rain gardens and ponds can be incorporated into even small developments (see also ‘urban greening and access to nature’).

6.64 SuDS should be a requirement of all new developments and should follow the principles set out in the Thurrock Design Strategy SPD, Essex Green Infrastructure Standards and Essex SuDS Design Guide.

Figure 6.7: Drainage hierarchy showing preferred approaches to managing surface water runoff

(1= preferred; 6=least preferred)



6.65

Alignment with Vision and Objectives:

6.66 The ‘wetlands and water management’ projects help to achieve the Vision by supporting the following objectives:

- Objective 3: Climate change adaptation and flooding – by encouraging nature-based responses to flooding and sea level rise.
- Objective 5: Biodiversity – by protecting and enhancing saltmarsh and increasing riparian woodland planting.

Key partners

- Environment Agency
- RSPB
- Essex Wildlife Trust
- South Essex Catchment Partnership
- CaBA catchment partnership (riparian woodland) & Catchment sensitive farming
- Essex and Suffolk Water company
- Local landowners
- National Highways
- Essex County Council

Potential delivery mechanisms

- Local Nature Recovery Strategy

- Planning and Development Opportunities (including through Section 106 agreements)
- Ecosystem development/payment for ESS
- Multi-agency opportunities
- Developing robust planning policies (both strategic and site specific) and design guidance to secure multi-functional blue infrastructure measures (including SUDS, green roofs, rain gardens and greenspaces) as part of new development, particularly in larger scale site allocations. The selection and design of these measures should be informed by key evidence such as NE's emerging GI standards, Thurrock's Health and Wellbeing Strategy and data on location specific needs (e.g. ensure GI has a strong focus on SUDS in areas at high surface water flood risk).

Key risks and challenges

- Constrained floodplains due to development can restrict the scope of corridor restoration and some measures (such as 'daylighting' rivers) can be expensive.
- Nationally Significant Infrastructure - Lower Thames Crossing
- Land ownership e.g. for flood storage opportunities.

Key ongoing projects

Thurrock Council has received funding through the Defra Flood and coastal resilience innovation fund for the below projects:

- Bulphan: The Council aims to create interventions within the upper catchment which intend to help Bulphan in terms of flows and to build a large pond and wetland system as it is the lowest part of the catchment which then flows into the Mardyke River. The overall aim is to build flood resilience in Bulphan and to create a hydro citizenship to uptake these sorts of projects and maintain them down the line. This aligns with the

Thames River Basin Management Plan aim of encouraging communities to take ownership of water quality within their area.

- Hope River: A project is being proposed along the A13, the Hope River floods within the area, which is aiming to reduce flow from the upper catchment via working with farmers to plant more trees and utilise the ditches and check dams which would then reduce flooding in Stanford le hope.
- Balstonia Park: The project is aiming to utilise flood and rainwater as pipe connection water within Balstonia Park. If it is successful, then the overall aim is to roll out this intervention across Thurrock.
- The South Essex Catchment Partnership has also delivered a single wetland creation project in the last few years at Davy Down.

6.67 The Thames Estuary 2100 Plan is being updated consultation on the updated plan closed in November 2022.

Next steps

6.68 Identify and engage with all relevant partners, such as the landowners in Thurrock, Essex Wildlife Trust and National Highways. This will help to ensure all relevant parties are working towards enhancing wetlands and building climate resilience.

6.69 The new Local Plan should include robust planning policies to ensure SUDS and other green and blue infrastructure measures are incorporated in all development proposals.

Urban greening and access to nature

6.70 Maximising green space, 'greening' features and access to nature close to where people live (or will live) to support healthier communities.

The opportunity

6.71 In Thurrock, as elsewhere, different communities have differing provision of and access to greenspace and wider green infrastructure such as street trees (see also 'Expanding areas of woodland'). Thurrock's current areas of accessible green infrastructure are shown overlaid on areas of deprivation, on **Figure 6.8**. Urban greening should be focussed in areas with the poorest access to green infrastructure and/or highest levels of deprivation (as GBI can improve quality of life).

6.72 Chapter 4 identifies the parts of the borough with the poorest access to greenspace; many of Thurrock's urban areas could benefit from improved access to and/or quality of local greenspace. Access to blue infrastructure could also be improved for recreation, particularly to the Thames (see 'Riverfront heritage'), Mardyke (see 'Mardyke Valley Park') and Thurrock's lakes.

6.73 Environmental quality is one of a number of wider determinants on health and health inequalities. To help to tackle this issue, Thurrock's recently updated Health and Wellbeing Strategy highlights the need to improve access to greenspaces as well as enhance air quality and the food environment. Such spaces could also support social prescribing. Interventions focusing on areas of deprivation would help secure the most benefits to people and their wellbeing. Research suggests that boosting access to natural greenspace is particularly beneficial for wellbeing and that wider urban greening measures such as green roofs, street trees, hedges and rain gardens can also provide a range of benefits, from amenity, cooling/shade in hot weather, supporting biodiversity and reducing flood risk.

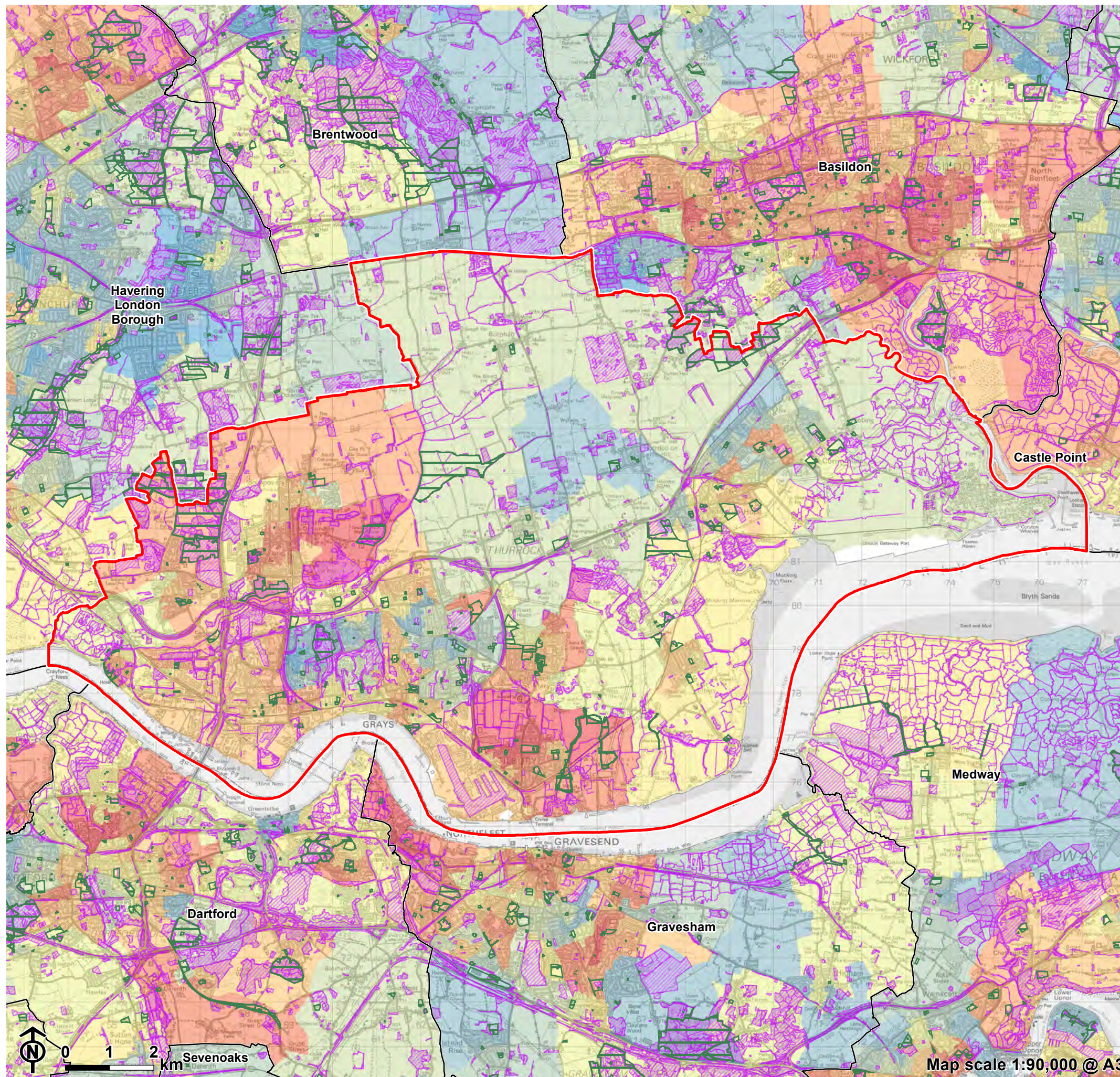


Figure 6.8: Urban greening and access to nature

- Thurrock Council boundary
- Neighbouring authority boundary
- Accessible green infrastructure**
 - Accessible green infrastructure
 - Non accessible green infrastructure
- Index of Multiple Deprivation**
 - 0 - 10% (most deprived)
 - 10 - 20%
 - 20 - 30%
 - 30 - 40%
 - 40 - 50%
 - 50 - 60%
 - 60 - 70%
 - 70 - 80%
 - 80 - 90%
 - 90 - 100% (least deprived)

Good quality greenspaces in the right places

6.74 Good quality green spaces in the right place can improve health and wellbeing; these benefits can be achieved by enhancing existing spaces (and access to them) or creating new spaces. This can be done as an integrated part of new development, particularly for strategic sites, to meet the needs of the new community and reduce pressure on existing greenspaces. Greenspaces will need to be close to where people live and may have a range of features, from places for quiet enjoyment of nature, to places of activity or connection with Thurrock's heritage.

6.75 Chapter 4 sets out areas deficient in greenspace, based on Thurrock's Open Space Assessment and Natural England's GBI mapping. Areas of deficiency should be priorities for investment in open space, above and beyond plans in strategic growth areas (where GBI including local greenspaces should be fully integrated from an early stage of design). The Open Space Assessment should also be updated. Based on current evidence, priority areas for improving access to greenspace include:

- Parks and gardens in areas currently deficient (and near growth areas) e.g. South Aveley, Purfleet, north of Grays/Chafford Hundred & North Stifford; central area north of A13; west Tilbury / south of Chadwell St Mary etc
- Natural and semi-natural greenspace; especially around Grays, East Tilbury, Corringham, West Thurrock and Bulphan
- Amenity grassland e.g. at West Grays, south/east of Purfleet, Grays, West Tilbury, Southfields, central Corringham, North Orsett.

6.76 Where areas are removed from Green Belt designation, Local Plan policies should show how development must compensate for this loss with e.g. new/enhanced GBI, woodland planting, landscape/visual elements, improved biodiversity / habitat connectivity, improved access to new/existing recreation areas.

Neighbourhood wildlife sites

6.77 Neighbourhood wildlife sites are required that are easily accessible for all ages and abilities, whilst taking into account the need to minimise ecological disturbance (e.g. through providing information on sensitive habitats and species and directing visitors away from sensitive areas); see also 'Sites for wildlife'.

6.78 The creation of neighbourhood wildlife sites may be possible as part of new development (on-site or off-site) or through improvements to the accessibility of existing sites. The restoration of former minerals extraction and landfill sites, in particular, provides opportunities for this.

6.79 Other urban greening and accessible nature opportunities identified via wider studies and stakeholder engagement include:

- Chafford Gorges Nature Park habitat restoration: Calcareous grassland restoration and creation of a meadow wildlife corridor.
- Thurrock Thameside Nature Discovery Park: Additional habitat features and improved access for local community.
- Shell Haven & Fobbing Marshes: protection of critical infrastructure will also protect marshes, therefore opportunity to create 'important green area on the marshes' including public access and habitat creation.

Green features

6.80 Urban areas need to be greened to increase biodiversity and provide resilience to climate changes. Sustainable drainage ('SuDS') measures such as 'rain gardens' can address flood risk (see also 'Wetlands and water management'), areas of wildflowers to attract pollinators including through revised management of road verges, green roofs and street trees to provide urban cooling, biodiversity and air quality benefits). Where opportunities for delivering greenspaces on site are limited the designing in of such features

should be maximised. **Figure 6.9** illustrates some examples of how green features can be incorporated into a residential street.

6.81 The Local Plan will require strategic and site specific policies and design guidance to secure multi-functional urban greening measures (including street trees, hedges, SuDS, green roofs and greenspaces) as part of new development, particularly in larger scale site allocations. The selection and design of these measures should be informed by key local and emerging evidence such as the Essex Green Infrastructure standards, Thurrock's Health and Wellbeing Strategy and data on location specific needs e.g. to ensure that GBI is designed to improve air quality in Air Quality Management Areas; or has a strong focus on SuDS in areas at high surface water flood risk.

Figure 6.9: Examples of urban greening in a residential street



Local food production

6.82 Local food growing such as allotments and community gardens can provide opportunities for environmental education, health and wellbeing benefits, and reduce food miles. There is currently a higher demand for allotments in Thurrock than there is supply.

6.83 Opportunities should be sought for local food production e.g. allotments, community orchards, community gardens in addition to private gardens. This can be achieved by adapting existing underused spaces or expanding existing allotments (e.g. Rosedale Road & Bull Meadow Allotments, Grays) and designing in new food growing spaces as part of new development.

Water-based recreation

6.84 Thurrock has a number of former quarries that are now lakes (see also 'wetlands and water management'. There are opportunities to improve these both for biodiversity and recreation. Opportunities include:

- Grangewaters - Protect and enhance the facilities and activities at Grangewaters Outdoor Education Centre, as well as improvements to biodiversity within waterbodies (see also 'Mardyke Valley Park').
- Lakes at Belhus Woods Country Park – Conserve and enhance opportunities for water-based recreation and biodiversity and Belhus Country Park. Currently there is a small network of lakes within the Belhus Woods Country Park. These currently provide fishing, conservation and hobby (e.g. model boat) facilities.
- Lakeside - Expand and create opportunities for water-based recreation and biodiversity at Lakeside. Two areas of water, one acting as a feature of the Lakeside shopping centre and the other separated from Lakeside by the A1306. There is an opportunity to expand engagement with these water bodies for example by providing opportunities for activities such as

stand-up paddle boards or splash pools, as well implementing biodiversity enhancements.

6.85 Along the Thames, opportunities to access river transport or leisure moorings could be increased, for example:

- Thurrock Yacht Club - Provide a safe, attractive focal point for waters sports, boating and leisure activities at Thurrock Yacht Club by improving facilities and supporting infrastructure.
- Infrastructure to support enhanced river transportation – Utilise and improve existing infrastructure to support an enhanced river transportation network, improving access to and from central London.
- Additional leisure moorings - Increase the number of leisure moorings in Thurrock. This will involve a review of river characteristics to identify suitable locations for leisure moorings to be used by visitor or potentially annual berth holders.

Alignment with Vision and Objectives:

6.86 The ‘urban greening and access to nature’ projects help to achieve the Vision by supporting the following objectives:

- Objective 1: Health and wellbeing and access to nature – by providing accessible nature, near to where people live.
- Objective 5: Biodiversity – by providing local sites for people to visit, reducing pressure at sensitive sites.
- Objective 6: Green Belt – by identifying opportunities for accessible greenspace that could compensate for development within the Green Belt.

Key partners

- Large landowners

- Developers and local authority planners
- Highways team
- Other local community groups
- Local businesses

Potential delivery mechanisms

- Planning policy and design guidance (see Chapter 7)
- Mandatory biodiversity net gain (BNG) requirement for new development from late 2023
- CIL contributions from development to pay into greening projects
- New environmental land management scheme funding from government could support enhancements to and/or expansion of existing wildlife sites – explore opportunities to work with key landowners
- Engaging with Highways re opportunities to manage road verges for biodiversity
- Establish GBI as part of Minerals and Waste restorations e.g. Thameside Nature Discovery Park
- Create a knowledge sharing platform/tool for sharing information on community gardens/food growing opportunities
- Create local circular walks with clear signage, especially in areas of green infrastructure deficiency
- Promote opportunities in local green spaces, from social proscripting (working with Health and Wellbeing Board) to wider opportunities for biking, walking, enjoying nature and heritage, etc
- Charitable giving and voluntary sector involvement

Key risks and challenges

- Complications of retrofitting improved access and GI to existing settlements
- Challenges of long-term stewardship of urban greenspaces.

Key ongoing projects

- Community food growing projects in South Ockendon, supported by Thurrock Council (Clayburn, Peartree Close, Avon Green, Lime Close Hall).
- Ongoing management of existing neighbourhood wildlife sites, such as Chafford Gorges Nature Park.
- Thurrock Council is exploring opportunities to improve parks and open spaces in Tilbury and Chadwell St Mary (Anchor Fields, Fielding Avenue, King George's Field, Koala Park, Orsett Heath, and Wickham Park).
- Planned flood defence improvements along the Thames will be combined with improvements for people (England Coast Path) and wildlife.

Next steps

6.87 Develop Local Plan policies and design guidance to support urban greening and improved access to nature.

6.88 Update the Thurrock open spaces study, to assess quality of existing open spaces and community need, and to update open space standards. This could be carried out alongside an update to Thurrock's strategy for active space (ie for sports and leisure), which also needs to be updated.

6.89 Natural England's GI Framework area-wide standards could also be applied to the borough, to better quantify the GBI baseline and define locally-

appropriate targets for urban greenspace (e.g. access to nature, urban greening and tree canopy standards).

Riverfront heritage

6.90 Protect and enhance the heritage along the river within Thurrock while taking into account the impacts of climate change, recreational access and the proposed Lower Thames Crossing.

The opportunity

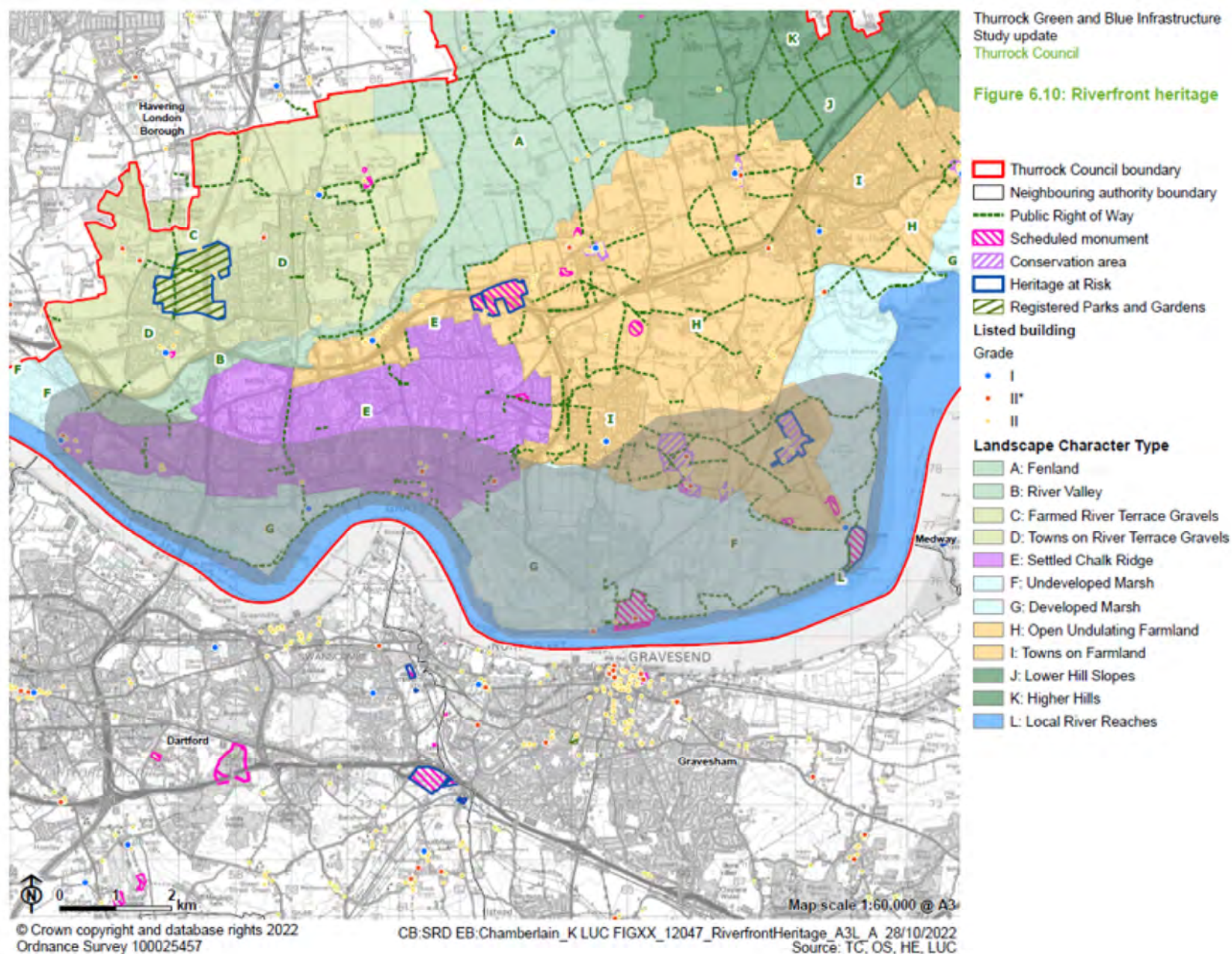
6.91 Thurrock has around 30km of Thames riverfront. The water itself is dominated by large vessels docking at Tilbury Docks, London Gateway and Purfleet and much of the riverfront is characterised by commercial activities including industry and ports alongside open marshland. The large scale commercial operations prevent easy access to the waterfront, in many places (see also 'Urban greening and access to nature').

6.92 As described in the Landscape Character Appraisal, the first towns began to develop in Thurrock in the Iron Age, with identified Roman and medieval settlements up to the modern day. Humans have dramatically changed the landscape through time, for example through development, mineral extraction and landfilling, farming and reclamation of marshland. A changing climate continues to alter the historic landscape features along the Thames Estuary.

6.93 Further change will occur in Thurrock that will affect historic assets and landscapes. For example, the proposed Lower Thames Crossing tunnel entrance would be situated between Tilbury Fort and Coalhouse Fort. There are opportunities for GBI to help residents and visitors to Thurrock to connect with the borough's heritage, both along its urban riverfront and in the more rural parts of the estuary coastline.

6.94 Thurrock's riverfront heritage features and landscape character are shown on **Figure 6.10**, with the indicative priority area shaded grey.

Figure 6.10: Riverfront heritage



Celebrating urban riverfront heritage

6.95 The River Thames is an important recreational and economic asset; opportunities should therefore be sought for people to look out over the river, walk along it, learn about its history, visit businesses along it, and access river transport.

6.96 The Thames Estuary's culture and heritage should be celebrated, as it has played such an important role in Thurrock's history and will continue to play an important role in the future. There may be opportunities to use the Thames as backdrop for a programme of cultural activities and events e.g. outdoor performance space; and to make more of the shared history with the south side of the Thames. Key (new or existing) visitor destinations along the estuary should be connected to the surrounding area and used as a catalyst for further improvements in access and celebration of heritage.

6.97 The challenge in Thurrock's urban areas is to increase safe access to the riverfront alongside economic activities, while also restoring biodiversity and natural flood management processes (see also 'Wetlands and water management' and 'Urban greening and access to nature'). 'Estuary Edges' [See [reference 81](#)] provides some useful principles for balancing some of these, for example: masterplan early in a site's design, look to the surrounding area to influence design (e.g. archaeology and heritage), and choose the best ecological value practicable.

6.98 It may be that some areas of riverfront will remain inaccessible to the public, but where sites become available for development along the estuary, opportunities should be sought to improve access and biodiversity, and celebrate its heritage.

6.99 Opportunities should also be sought to extend or link to existing riverfront destinations (see Tilbury Country Park, below). Within the more urban parts of Thurrock, this could include the creation of a Green Discovery Park. This is a

proposal identified within the Essex GI Strategy and would be intended to showcase green infrastructure, solar energy, sustainable drainage systems and natural flood management techniques, climate resilient plants, examples of natural habitats designed to maximise biodiversity, waste and recycling and electric vehicle charging points. A sustainable multi-functional visitor centre would also provide an inspirational, interactive and educational experience. A potential location for this could be alongside the existing West Thurrock Marshes wildlife site, if land became available, as this would provide a destination that draws on industrial and natural heritage of the area, within walking distance of Grays and West Thurrock.

Tilbury Country Park

6.100 Tilbury Fort and Coalhouse Fort are spectacular heritage features on the Thames Estuary that should be celebrated more and could be a major draw for a new country park in the East Tilbury and West Tilbury area.

6.101 A country park in this area would provide spaces for recreation, health and wellbeing, areas for wildlife and a celebration of heritage. The park would link into the PROW network to access on foot or by bike/wheels, including from the England coast path (see also 'A network for movement').

6.102 The marshes in this area are undeveloped grazing marsh with naturalistic and historic drainage features that provide habitats of biodiversity value; a park in this area would enable grazing marsh to be restored.

6.103 Tilbury Fort (managed by English Heritage) and Coalhouse Fort (managed by Thurrock Council) would both benefit from improved access and interpretation, to ensure that visits and funding support conservation of the sites. Coalhouse Fort has sits within parkland with Green Flag status and may provide opportunities for income generation such as wedding hire. Both forts could be enhanced for biodiversity.

6.104 The major challenge in this area is the proposed NSIPs, with the Lower Thames Crossing (LTC) and the East Anglia GREEN both proposing route corridors through this area. The most recent LTC proposals show an open space around the tunnel entrance on Tilbury Marshes ('Tilbury Fields'), with a retained England Coast Path. The development would retain the right of way that links the two forts (which is part of the England coast path) and a new landscaped open space is proposed close to the tunnel entrance, but the new motorway could impact upon the historic landscape and the setting of the forts.

6.105 The new landscaped open space could be linked into a wider area of parkland connecting the two forts; although, without the LTC, a country park or area of accessible marshland / restored landfill sites could extend further north than would be possible with the LTC.

6.106 Any footpaths crossing the LTC route would also be upgraded to bridleways as part of the LTC project, which would provide an opportunity for the creation of longer routes suitable for cycling or horse riding. The East Anglia GREEN proposals are not yet developed beyond an approximate route alignment; therefore designation of an area for a new country park may facilitate discussions around suitable routing and mitigation at a later date.

6.107 A key part of making a country park in this location accessible would be the provision of a safe, attractive route for pedestrians and cyclists from Grays to Tilbury Fort, via Tilbury Station. The link would enhance access along the river by providing a missing section of NCN route 13 and extending the Thames Estuary path further into Grays (see also 'A network for movement'). This park could also provide a SANG (see paragraph 6.15) to alleviate recreational pressure from the Thames Estuary and Marshes SPA and Ramsar site.

Alignment with Vision and Objectives:

6.108 The 'riverfront heritage' projects help to achieve the Vision by supporting the following objectives:

- Objective 1: Health and wellbeing and access to nature – by encouraging access to the River Thames and nature along it.
- Objective 4: Landscape, historic environment and sense of place – by celebrating the historic environment and landscape along the Thames.

Key partners

- Historic England
- Environment Agency
- National highways
- RSPB
- Essex Wildlife Trust
- South Essex Catchment Partnership
- Sustrans
- Essex County Council
- Port of London Authority

Potential delivery mechanisms

- Infrastructure Delivery Plan
- Cycling and Walking Strategy
- Lower Thames Crossing

Key risks and challenges

- Development pressures
- Lower Thames Crossing

Key ongoing projects

6.109 Thurrock Council (emerging/current project): Through Defra's flood and coastal resilience innovation fund, Thurrock Council is hoping to improve shoreline and pollution by using mycelium to reduce pollution within the land at Coalhouse Fort Park and potentially create a flood meadow with connection to LTC.

Next steps

6.110 Continue to engage with Historic England and National Highways to identify opportunities for funding and joint working, for example by influencing and/or aligning with mitigation proposals for the Lower Thames Crossing, or opportunities to enhance the areas around Tilbury Fort..

Mardyke Valley Park

6.111 Create a continuous parkland from Purfleet to Grangewaters that acts as a corridor for active travel, natural flood management and biodiversity and provides opportunities for landscape restoration.

The opportunity

6.112 The River Mardyke runs from the fenland in the north of the borough to Purfleet on Thames. The Mardyke Valley area has been the focus of significant investment in recent years that has delivered improvements to access; ecological enhancement to woodland, floodplain grazing marsh, reedbeds, habitats for protected species; and floodplain restoration. Grangewaters has two lakes; the larger is used by the adjacent outdoor education centre, and the smaller by anglers. This site could become a more significant visitor destination. There is therefore an opportunity to build upon the investment to date, to create a continuous parkland from the Thames to Grangewaters, that provides multi-functional benefits. There is also an opportunity to link the parkland north into the fens, to the medieval village of Bulphan, both in terms of rights of way and landscape-scale initiatives such as nature-based water management (see Wetlands and water management).

6.113 The Landscape Character Assessment for Thurrock sets out a vision for the part of the Mardyke Valley that would form the core area of parkland (Purfleet to Grangewaters):

Lower Mardyke Valley

The vision for this character area is: a naturalistic valley landscape comprising a mosaic of ancient riverside pastures on the valley floor, and a

strong pattern of valley side pastures bounded by healthy hedgerows and actively managed deciduous woodlands on the valley sides, creating an accessible greenspace and break between adjacent urban areas and with well- preserved historic landmark features good opportunities for open air recreation and enjoyment of the landscape.

6.114 This landscape connects into the fenland to the north, adjacent urban areas, and estuary landscapes to the south.

6.115 The Thames Chase Plan also establishes a vision for the area:

Mardyke Valley & Aveley Forest.

Vision: Developing a Community Forest landscape framework will improve the setting and integration of South Ockendon into the landscape and promote the enjoyment of the area for outdoor recreation. The large areas of filled land and landfill sites to the north west and east of South Ockendon provide an opportunity to bring the Community Forest to the village and the restoration of derelict sites will have considerable benefit in improving the perception of this area as a place to live and work.

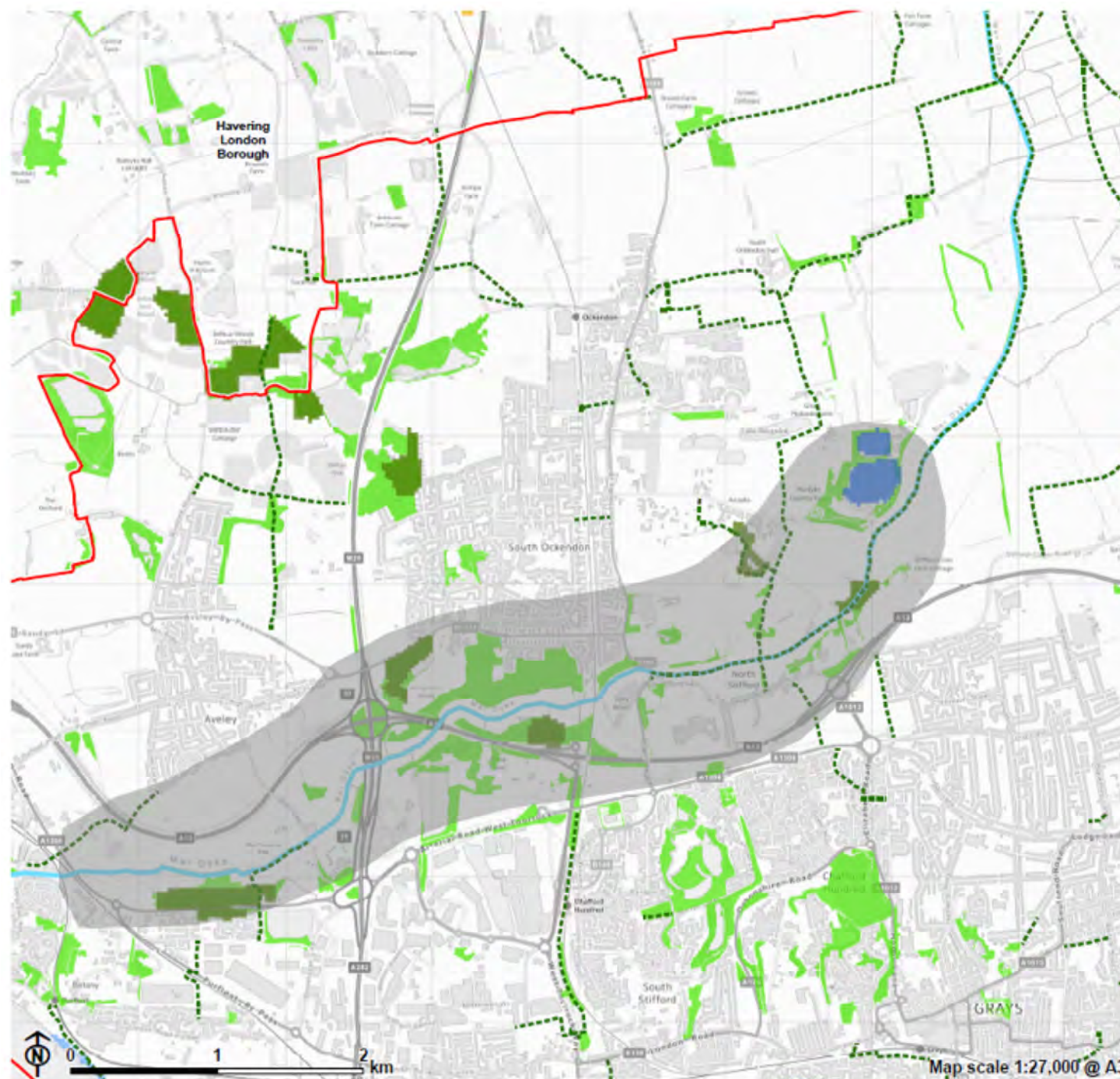
At Aveley there is growing momentum to co-ordinate the management of separate landholdings to achieve greater cohesion and benefits including increased enjoyment by the public and wildlife conservation. This will not create a single, continuous park but a mosaic of co-ordinated land uses, and it is intended that the management of all the respective blocks of land creates an opportunity to promote the area as a showcase/role model for good practice of multi-purpose land management.

There is a real opportunity to look at the future of the Mardyke Valley to achieve nature conservation, landscape and recreation objectives. This should be done by co-ordinating the management of the watercourse, adjacent land and woodlands, creating new strategic access and restoring the Stifford Pumping Station to a new use that supports leisure and learning

6.116 Key areas for further improvement within the Mardyke Valley relate to biodiversity and flood management; and improvements to access and the visitor experience. Carefully designed flood management features could also help to restore some historic landscape features.

6.117 The opportunity area, in relation to existing habitats and rights of way, is shown on **Figure 6.11**, shaded grey. Locations for key enhancements are shown on **Figure 6.12**.

Figure 6.11: Mardyke Valley Park





Proposed enhancements:

Hard landscape interventions:

-  **Existing accessible route:** surfaced path/bridleway
2.4m wide accessible multi-use path route
-  **Existing route:** (unsurfaced) defined footpath route
to receive upgrades to improve accessibility
-  **Proposed new access route:** 1.5 - 2.5m wide
accessible route to extend/marry with existing path
-  **Proposed new timber board-walk:** elevated walking
route provide loop routes and access to nature
-  **Car parking improvements:** Existing car park to be
improved/increased to facilitate increased use.
-  **New car park provision:** New low key car park
provision to encourage wider use of Mardyke Valley
-  **Proposed seating opportunity:** seating along
existing/new routes to promote rest and relaxation
-  **Proposed view point / viewing platform:** raised
platforms for views/visual connection along the valley
-  **Proposed access / bridging point:** key access
connection and bridging points across the Mardyke
-  **Key destination point:** focal points and amenity
along Mardyke Valley - increased Davy Down activity

Signage: improved strategy for Mardyke Valley

-  **Proposed woodland planting:** new native woodland planting infill, and linkages to existing
-  **Proposed wetland planting:** wetland scrapes, ponds and wet woodland to valley corridor
-  **Proposed water filtration:** closed system planting filtering surface water run-off from road infrastructure

-  Retail and entertainment centre
-  Residential / settlement
-  Open green space / farmland
-  Wetland / seasonal flooded wetland
-  Water body: water course / lake / pond
-  Industrial / commercial
-  Woodland / tree planting
-  Indicative LTC route



Biodiversity and flood management

6.118 The Mardyke Valley is a priority area in which to develop nature-based solutions to flood management and to increase biodiversity (see also ‘Wetlands and water management’ and ‘Expanding areas of woodland’).

6.119 Measures that would deliver biodiversity improvements and natural flood management within the Mardyke Valley are:

- New native tree infill and woodland planting along the Mardyke Valley to strengthen links with existing woodland pockets (predominantly along the southern valley boundary). Planting will promote climate resilience, woodland succession, flood mitigation, urban screening, and habitat creation. Where new development is in proximity to the Mardyke, retention or planting of woodland will also help to reduce run-off into the river.
- Creation of new wetland planting along the seasonal floodplain to increase habitat and flood attenuation through wetland scrapes and wet woodland planting.
- Reed bed planting to capture and filter incoming water sources to the Mardyke Valley from existing infrastructure networks such as road and rail.

Accessibility and visitor experience

6.120 The proximity of the Mardyke Valley to a number of built-up areas means that a park here would benefit many existing and future residents of the area.

6.121 Key interventions have been identified that would improve the visitor experience and contribute to the sense that the valley is a single parkland:

- Increased legibility through signage and clear routes;
- Upgraded entrances, and amenities to access along the valley;

- Improved variety in routes, with a focus on increased circular routes and way-finding;
- Provide a greater 'sense of place' along the Mardyke valley to facilitate greater local use along the middle and lower sections of the route;
- Create new connections with established destination points, enabling links out to wider catchments and green infrastructure routes and new access routes to key local amenities such as RSPB Rainham Marshes. The National Cycle Network currently runs alongside the Mardyke between Davy Down and Ship Lane, but could be extended/linked further west; and
- Connectivity to Brentwood Parklands (identified as priority area for the SEE Park in the South Essex GBI Strategy).

6.122 A study [\[See reference 82\]](#) into the physical interventions required to achieve the above recommended the following:

- New multi-use path lengths (surfaced) to link existing Mardyke Valley way route to the lower (Western) corridor, improving connections to Purfleet and RSPB Rainham Marshes in the South, including new footbridges and across the Mardyke linking to existing PROW networks.
- Sections of new raised boardwalk creating loop routes at Ship Lane and Davy Down to encourage wider use and connectivity along the valley.
- Increased car parking facilities at Davy Centre
- New car parking provision at Ship Lane to better connect users with walking routes, improved access to wider links, and key destinations.
- Localised path upgrades to existing route from Davy Down to proposed LTC route, including two new footbridges over the Mardyke improving access/ connectivity
- New signage strategy along the route to enhance identity, historical interpretation, and access signage.
- Series of new benches and viewing platforms to create points of rest and relaxation along the valley (currently no provision for seating).

6.123 Routes along and linking to the Mardyke Valley would be part of a wider network for active travel (see also ‘A network for movement’), improving accessibility for horseriding walking, cycling, and users of other wheels (e.g. buggies, wheelchairs).

Alignment with Vision and Objectives:

6.124 The ‘Mardyke Valley Park’ projects help to achieve the Vision by supporting the following objectives:

- Objective 1: Health and wellbeing and access to nature – by increasing use and enjoyment of the Mardyke Valley.
- Objective 3: Climate change adaptation and flooding – by utilising nature-based solutions to flooding.
- Objective 5: Biodiversity – through habitat creation.

Key partners

- Thames Chase Community Forest
- Forestry England
- Woodland Trust
- Landowners
- CaBA catchment partnership (riparian woodland) & catchment sensitive farming
- National Highways
- Sustrans

Potential delivery mechanisms

- Catchment management plan

- Thurrock Council is considering best use of Grangewaters (lakes and outdoor education centre)
- New development close to Mardyke: contributions to improve access and habitat creation/enhancement
- Lower Thames Crossing mitigation and compensation. The latest proposals show the new road crossing the Mardyke north of Grangewaters, with flood compensation measures proposed as part of the scheme mitigation.

Key risks and challenges

- LTC – awaiting resubmitted application
- Multiple landowners

Key ongoing projects

- Mardyke Woods: Forestry England project funded by Heritage Lottery Fund and Veolia. Improvements to woodland for wildlife and access.
- South Essex Catchment Partnership, wetland habitat creation at Davy Down.
- Thames Chase Community Forest, various projects.

Next steps

6.125 Policy development and masterplanning of development locations close to the Mardyke Valley, to maximise opportunities to improve access, connections and biodiversity.

6.126 Continue to work in partnership with the Thames Chase Trust and to engage with the National Highways to identify opportunities for enhancement and funding, within the Mardyke Valley area.

A network for movement

6.127 Create a network of rights of way and new greenways that provides routes for walkers, horse-riders, cyclists, and other users of wheels to access urban and rural greenspaces. The network will also benefit commuting and other recreational journeys by providing pleasant, safe routes.

The opportunity

6.128 Thurrock has routes for cycling, walking and horse riding, but in some places they are fragmented. There is a need for a network that provides for local and long distance trips to GBI, by a range of modes.

6.129 Chapter 4 sets out the gaps in the network identified by various studies. These fall into the following categories of opportunity:

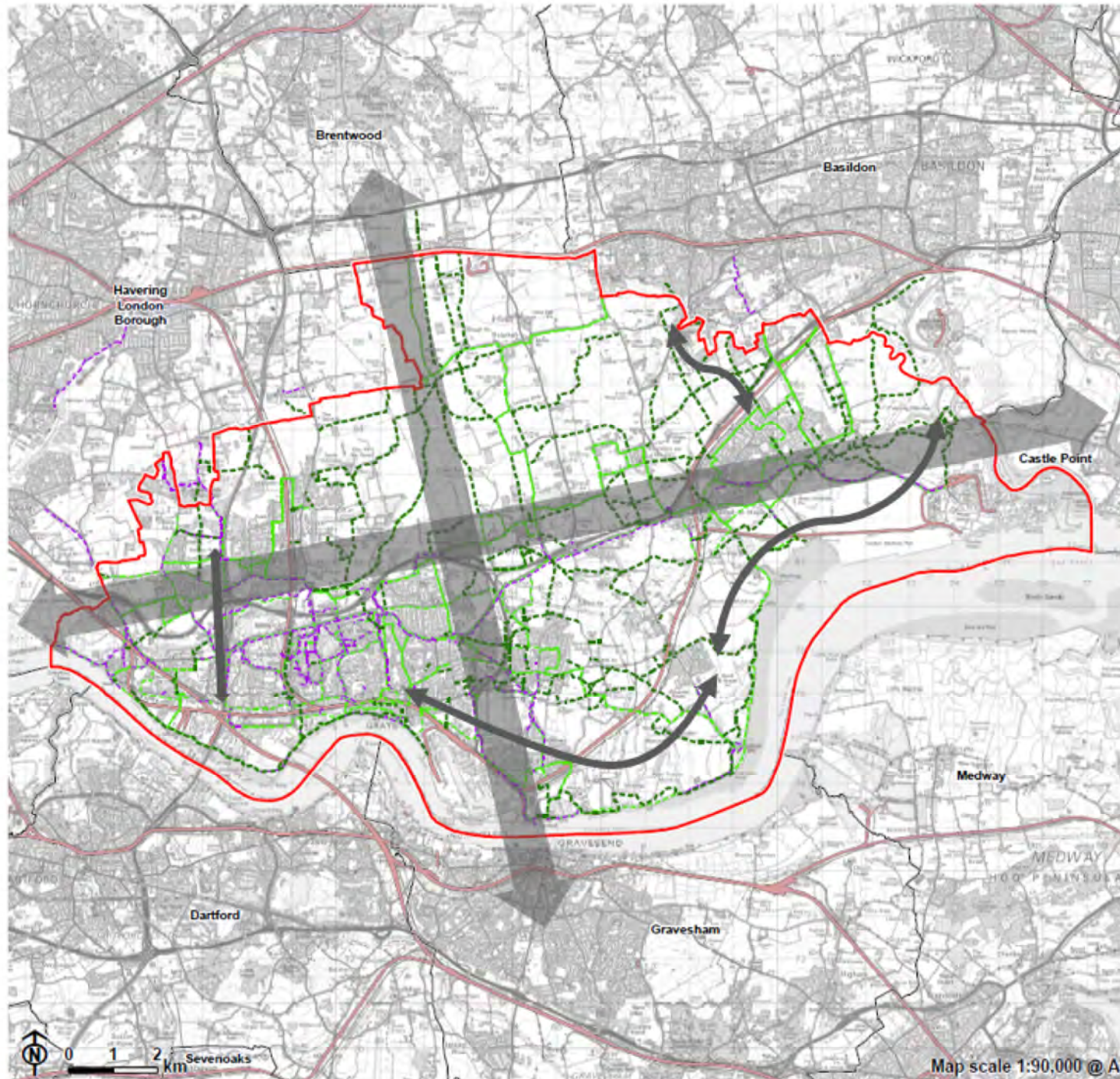
- Improved long distance connections through the borough for all modes, particularly east-west e.g. Purfleet-Grays-Tilbury-East Tilbury; and Chadwell St Mary to East Tilbury and Linford (particularly with the LTC in operation); link together gaps in the National Cycle Network and bridleways. These links could be green corridors, ie shared routes within a landscaped and planted corridor.
- Improved routes along the Thames (e.g. upgrading footpaths to shared use, improved safety) and links to it, e.g. from West Thurrock, Chafford Gorges and Stanford-le-Hope, to provide access to the estuary (see also 'Riverfront heritage' and 'Urban greening and access to nature').
- Better walking, cycling and horse-riding access to the fenland and Mardyke e.g. from South Ockendon and Aveley; and from there into nearby accessible greenspaces e.g. Belhus Woods and RSPB Rainham Marshes.

- Overcoming severance caused by major roads e.g. improved routes and crossings over the A13 (e.g. Aveley to Purfleet and Stanford-le-Hope to Orsett) and the LTC. These could be green bridges or greenways.
- Other improvements to infrastructure for walking and cycling that could help link urban areas to GBI e.g. crossing and junction improvements, segregated or shared routes, signing and lights.

6.130 Thurrock Council has a programme of improvements to cycling and walking infrastructure; however a strategic approach is needed and could be set out in the Council's walking and cycling strategy (which has been commissioned).

6.131 Figure 6.13 is an indicative diagram showing the principles of local and long distance connections that should be incorporated into a network for movement.

Figure 6.13: A network for movement



- ▬ Thurrock Council boundary
- ▬ Neighbouring authority boundary
- - - Public Right of Way
- - - Traffic free cycle route*
- - - Other cycle route*
- ▬ Railway

*Note: Indicative Data - Data from previous Thurrock project in 2016

Rights of Way network

6.132 Thurrock Council has commissioned a strategic multi-modal transport model as part of its Local Plan work, which will model the effects of proposed development and help to inform investment in infrastructure. A walking and cycling strategy has also been commissioned; this work will help to tie together the priorities identified through the transport and GBI work.

6.133 To enhance the GBI network, improvements to the rights of way network should focus on the following:

- Green corridors and bridges: providing biodiversity, landscape and health benefits (e.g. air pollution filtration) alongside cycling, walking and horse riding infrastructure.
- Links to accessible GBI, e.g. to/along rivers, accessible wildlife sites and parks.

6.134 Improvements to the rights of way network for GBI would also benefit travel for other purposes, particularly where new or improved links create or connect with circular or long distance routes.

6.135 The proposed LTC will provide opportunities to achieve some of these improvements, as well as some disruption to the existing GBI network. Some of the opportunities identified through the LTC work, for example upgrading of footpaths to bridleways, could be undertaken by the Council if the LTC is not granted permission.

Urban infrastructure

6.136 Improving walking or cycling infrastructure in urban areas can be achieved through measures that also introduce urban greening e.g. by

reallocating road space and providing space for street trees (see 'Urban greening and access to nature').

6.137 New developments also provide opportunities to provide multi functional open spaces that incorporate walking/cycling routes, or green corridors. Where those development occur in Green Belt, the requirement to compensate the loss of Green Belt could be used to improve off site access to GBI.

Alignment with Vision and Objectives:

6.138 The 'network for movement' projects help to achieve the Vision by supporting the following objectives:

- Objective 1: Health and wellbeing and access to nature – by increasing opportunities for walking, riding and wheeling.
- Objective 2: Climate change mitigation – by reducing the need for car travel.

Key partners

- Neighbouring local authorities
- Essex County Council as highways authority for Brentwood, Basildon and LB Havering
- Sustrans and other cycling interest groups
- Horse riding interest group/s?
- Walking interest groups / ramblers / national trails

Potential delivery mechanisms

- Infrastructure delivery plan
- Cycling & walking strategy

- LTC crossing and bridleway upgrades, other designated funds
- East Anglia GREEN funds

Key risks and challenges

- Retrofitting walking and cycling infrastructure in urban areas can be expensive.
- Unlocking longer distance routes requires cooperation of multiple landowners.

Key ongoing projects

- Changes to rights of way network and mitigation proposed as part of the Lower Thames Crossing.
- Newly opened England Coast Path.
- Thurrock strategic multi-modal transport model and Walking and Cycling Strategy.

Next steps

- Update Thurrock's cycling and walking strategy, incorporating opportunities for other users of rights of way such as horseriders and other non-motorised wheeled transport.
- Continue to engage with consultation on the LTC.

Prioritisation of projects

6.139 As set out in Chapter 5, the Vision and Objectives have informed the identification of GBI projects. They have helped to do this by capturing Thurrock's priorities for GBI protection and enhancement; the selection of GBI projects has ensured that all of the objectives have been met by one or more of the projects. **Table 6.1** shows the objectives supported by the projects.

6.140 The 'expanding areas of woodland' projects support all of the objectives, reflecting the multifunctional benefits of woodland. In terms of the relative importance of individual objectives, climate change and the biodiversity crisis are of the highest priority and are threads that run through the other objectives, but all of the objectives are important. This study has therefore not attempted to rank the projects in terms of their priority, but provides a guide to the GBI priorities in specific locations or in certain situations (e.g. development within or on the edge of an urban area).

Table 6.1: Summary of objectives supported by the GBI projects

GBI projects	Objective					
	1 Health, wellbeing, access	2 Climate mitigation	3 Climate adaptation	4 Landscape & historic	5 Biodiversity	6 Green Belt
Sites for wildlife: ■ Woodland ■ Open mosaic habitat ■ Wetland		●			●	
Expanding areas of woodland: ■ Thames Chase Community Forest ■ Trees in urban areas	●	●	●	●	●	●
Biodiverse farming ■ Trees and hedgerows ■ Grassland and grazing			●		●	
Wetlands & water management: ■ Estuary restoration & habitat creation ■ Fenland riparian planting ■ SuDS in new developments			●		●	
Urban greening & access to nature:	●				●	●

GBI projects	Objective					
	1 Health, wellbeing, access	2 Climate mitigation	3 Climate adaptation	4 Landscape & historic	5 Biodiversity	6 Green Belt
■ Good quality greenspaces in the right places ■ Neighbourhood wildlife sites ■ Green features ■ Local food production ■ Water-based recreation						
Riverfront heritage: ■ Celebrating urban riverfront heritage ■ Tilbury Country Park	●			●		
Mardyke Valley park: ■ Biodiversity & flood management ■ Accessibility & visitor experience	●		●		●	
A network for movement: ■ The River Thames ■ Rights of way network ■ Urban infrastructure	●	●				

Chapter 7

Implementation and Delivery

7.1 This Strategy has been prepared as part of the evidence base for the Thurrock Local Plan. This chapter explains how policies within the Plan can support the projects and priorities set out in this Strategy; and the other elements that need to be in place alongside the Local Plan policies to enable GBI to be delivered and maintained.

7.2 Information on policies and guidance that provide the context for Thurrock policies is provided in Appendix B.

Embedding GBI into the Local Plan

7.3 To deliver on Thurrock's GBI ambitions it will be important to effectively embed GBI into the new Local Plan.

7.4 Natural England's Green Infrastructure Framework [\[See reference 83\]](#), which was launched in 2023 comprises a set of principles, standards, maps, a design guide, and 'process journeys' which explain how to use the tools in different contexts (e.g. in the preparation of a Local Plan). Its 'process journey for local planning authorities' sets out a series of key steps for "integrating a GBI Strategy" into a local plan and wider strategies:

- Ensure join up between Local Nature Recovery Strategies, GBI Strategies and GBI Delivery Plans.
- Use the evidence on local character to design good GBI as part of Local Design Guides/Codes.
- Include GBI Standards in Local Design Codes.
- Embed GBI in all relevant chapters/policies in Local Plans, including site allocations.

- Set requirements for GBI information within planning validation checklists.
- Ensure GBI is included across local government and stakeholder policies and strategies.

7.5 Stage 4 in the process journey, in particular ('plan strategically and develop green infrastructure policy'), is a helpful reference in identifying the best ways to embed GBI into a Local Plan. It includes recommendations such as:

"To assess whether new local planning policy or policies cover the breadth of green infrastructure at a strategic level, it can be useful to review whether the issues in the 5 'Why' Green Infrastructure Principles – green infrastructure for nature, health, property, water management and climate resilience and the 5 'What' Green Infrastructure Principles – multifunctional, varied, connected, accessible and reflect local character, are fully considered in local planning policy."

and

"Consideration should be given to the strength of wording of green infrastructure policies. An assessment of the strength of the policy wording including the extent to which the policy and supporting text promotes action can be useful. For instance, does the policy say you may wish to consider, or this action should be taken. This can make a difference in whether existing green infrastructure assets are safeguarded and not lost. Where this is unavoidable policies should ensure that mitigation and compensation for green infrastructure is designed to meet needs rather than simply replacing what has been lost. Green infrastructure policies should work together with policies on Biodiversity Net Gain to ensure an uplift in quantity and quality of green infrastructure."

GI Framework 'process journey for local planning authorities', 2023.

7.6 The application of the Framework's Principles and Standards is set out under 'design-led approach', below.

7.7 The policy recommendations in the South Essex GI Strategy also provide some useful high-level principles and reminders for good GBI policy making, as summarised below:

- Safeguard, maintain and enhance existing ecological and GBI networks, including connectivity between habitats.
- Seek to deliver varied and multi-functional GBI that is accessible to all and meets local needs, including by applying the Accessible Natural Greenspace Standard (ANGSt; note that the recent GI Framework updates these), enabling active travel and improved health and wellbeing, maximising natural flood management, conserving and enhancing nature rich places, protecting and enhancing the setting and access of heritage assets and key views, providing food growing spaces.
- Consider existing site management plans and strategies in the development of new proposals.
- Engage early with all relevant stakeholders, including regulatory authorities and landowners
- Consider funding options, including emerging offsetting markets, and how to secure long term stewardship.

7.8 There is a good general fit between these principles and those set out by Natural England for why GBI is needed and what good GBI looks like. [\[See reference 84\]](#)

Mainstreaming GBI

7.9 Research on what good GBI policy looks like by Hislop et al (2019) [\[See reference 85\]](#) provides a useful starting point. It highlights the importance of 'mainstreaming' GBI across policy areas i.e. ensuring that the value of GBI is understood and reflected in decisions/actions not only in the environment policy

domain but also in other policy domains (e.g. social and economic). GBI is a strategic ‘umbrella’ concept that, if planned and delivered effectively (based on sound evidence), can have multiple benefits across policy areas. This integrated approach is also reflected in Natural England’s GI Framework and the South Essex GI Strategy.

7.10 At early stages of Plan making, it may be appropriate to focus largely on developing a strategic GBI policy only, for the reasons set out above Hislop et al (2019) recommend that GBI policy should not just be solely located in a core policy in the environment section of a Local Plan. Rather, it should also be referenced in a range of other policies, such as those on design, housing, transport, climate change mitigation and adaptation, water management, biodiversity and open space (based on discussions with relevant experts across council departments).

7.11 It may therefore be useful to provide training to council officers and elected members to improve understanding of the multiple benefits of GBI, to support policy development.

7.12 Hislop et al (2019) identify seven key areas to address in a ‘good’ GBI planning policy, which are summarised and updated below to illustrate the links between these and the recent GI Framework:

- **Design process** – it will be important to emphasise the need to consider multi-functional GBI design from the pre-application stage onwards, including through engagement with relevant stakeholders (aligns with the GI Framework ‘process journey’ for local authorities).
- **Wider context** – GBI design should be informed by analysis of the site and wider context, including local needs, wider habitat networks, open space provision and public access (the GI Framework’s principles and standards set out how this information can be gathered).
- **Biodiversity** – GBI policy should link to policy on biodiversity net gain (mandatory BNG will be a key new driver of funding for GBI) and be designed to protect and enhance onsite biodiversity and habitat networks

within and adjacent to the site (supported by the GI Framework's principle 'nature rich beautiful places' and its urban nature recovery standard).

- **Water management** – sustainable drainage (SUDS) should form an integral part of multi-functional GBI design, maximising amenity and biodiversity benefits alongside flood management; and public access where safe and appropriate (supported by the GI Framework's principle 'improved water management').
- **Access networks** – GBI design should retain and enhance active travel routes (linking key destinations such as housing to town centres and schools) to encourage walking and cycling (supported by the GI Framework's principle 'active and healthy places' and its accessible greenspace standards).
- **Greenspace** – GBI should meet the council's quantity, quality and accessibility standards for open space, seeking to address deficiencies in access and be designed to cater for all in the community (the GI Framework includes the following headline standards: accessible greenspace standard; urban nature recovery standard, urban greening factor standard, and urban tree canopy cover standard).
- **Stewardship** – appropriate management and maintenance agreements for GBI, supported by clear and long-term funding mechanisms, must be agreed with the council (aligns with the GI Framework 'process journey' for local authorities; Stage 6).

Incorporating the strategic GBI priorities into the Local Plan

7.13 This strategy identifies overarching priorities for GBI that have been identified through analysis of existing data and stakeholder consultation. Further priorities may emerge, for example through partnership working, community led initiatives, further work, or the application of GBI Standards. Policies therefore need to set out strategic priorities for protection and enhancement, but retain some flexibility to allow GBI needs that have not yet been identified to be met.

7.14 The GBI projects identified in **Chapter 6** require policies that:

- Identify areas to be protected, e.g. designated sites, ancient woodland; these should be identified on the policy map.
- Identify areas to be enhanced, e.g. the Mardyke Valley Park, Tilbury Country Park, fen and marshes.
- Require/encourage urban greening and the greening of new development.
- Set out principles for the provision of GBI within new development e.g. connectivity to existing/future greenspace, woodland creation, targets for biodiversity (BNG).
- Set out principles for the development of sites on land removed from Green Belt designation, e.g. improvements to public rights of way, accessible woodland creation.
- Encourage active travel and improve (non-car) connectivity to GBI assets.
- Require/encourage measures that improve environmental quality e.g. air, water, soils; and resilience to climate changes.
- Provide design principles for development in specific areas e.g. Mardyke Valley, Thames riverfront, areas of Green Belt.
- Provide flexibility to respond to uncertainty around future development e.g. LTC.
- Identify how developer contributions will be targeted to support GBI initiatives e.g. minimising recreation pressure at designated sites, improvements to parks.

7.15 Natural England's GI Framework includes a set of headline standards, that can be applied to the whole local authority area and to major developments. The Framework has recently been published, but is considered best practice. In order to further refine the understanding of strategic GBI needs and opportunities, the standards could be applied to the borough as follows:

- **S1 Green Infrastructure Standard:** the preparation of this GBI Strategy has followed a similar approach to that set out in the Framework's 'process journey'. Application of the remainder of this standard is about

incorporating GBI into policies, considering how GBI standards can be applied locally, and setting SMART targets for achieving these.

- **S2 Accessible Greenspace Standard** including quality standards: updating Thurrock's open space study would provide valuable baseline information on open space quantity and quality, which would enable the council to define locally-appropriate standards for access to greenspace.
- **S3 Urban Nature Recovery Standard**: this standard requires authorities to define a baseline for the proportion of GBI that is designed and managed for nature recovery, then to set a percentage by which this will be increased and targets for increasing the number of local nature reserves.
- **S4 Urban Greening Factor Standard**: meeting this standard would require Thurrock to achieve at least 40% average green cover in urban residential areas and no net loss of green cover in urban neighbourhoods.
- **S5 Urban Tree Canopy Standard**: requires local authority to set a locally appropriate target for canopy cover in urban areas. Tree canopy cover data is not yet available for the whole of Thurrock [See reference 86]; this information would assist the borough in working towards the standard.

7.16 The standards can also be applied to major development, and it is recommended that they are; these could be incorporated into broader design codes (see below).

Design-led approach

7.17 The National Planning Policy Framework (NPPF) states (in paragraph 128) that: "To provide maximum clarity about design expectations at an early stage, all local planning authorities should prepare design guides or codes consistent with the principles set out in the National Design Guide and National Model Design Code, and which reflect local character and design preferences." And that this approach can be used to, among other things, ensure that sufficient greenspace is provided with new development (paragraph 130).

7.18 Supplementary Planning Documents (SPD) or Design Codes can be used to provide additional details to accompany policies, and set out what will be expected to be delivered through development on new sites. The Levelling Up and Regeneration Bill includes a requirement for area-wide design codes for all local authorities.

7.19 The National Design Guide [\[See reference 87\]](#) is intended to guide local authorities in preparing locally-relevant design guidance and policies; and Natural England's recent GI Framework contains a Green Infrastructure Planning and Design Guide [\[See reference 88\]](#) that is intended to complement the National Design Guide, providing specific guidance on design for GBI. The Green Infrastructure Planning and Design Guide describes the characteristics of good GBI, including the features that form its 'building blocks', design for multi-functionality, and design within different types of places (e.g. urban areas, residential streets, parks). It is recommended that principles in this design guide are incorporated into a design code for Thurrock.

7.20 Thurrock has a Design Guide that was adopted in 2017. It has Supplementary Planning Document (SPD) status, ie it is a material consideration when determining planning applications. Thurrock Council also contributed to the development of the Essex Green Infrastructure Standards (which contains qualitative principles rather than quantitative targets). These documents, along with Natural England's GI Framework could be used to inform design codes for the borough.

7.21 The standards for GBI within the 2023 GI Framework set targets for major development, which would complement design codes. The standards are summarised below:

- **S1: Green Infrastructure Strategy Standard:** each major development has a GBI Plan (which could be part of a Design & Access Statement); this will set out how the development will deliver the GI Framework's principles and standards, and meet local policies and design codes.
- **S2: Accessible Greenspace Standard:** development must meet locally defined quantity, size and distance criteria for GBI. Accessible greenspace

must meet Green Flag award criteria and Sensory Trust guidance for accessibility.

- **S3 Urban Nature Recovery Standard:** development GBI Plan must set out how it will contribute to nature recovery, including potential creation of local wildlife sites.
- **S4 Urban Greening Factor Standard:** development meets National Urban Greening Factors [\[See reference 89\]](#) of at least 0.3 for commercial development, 0.4 for residential development and, where appropriate, 0.5 for residential greenfield development.
- **S5: Urban Tree Canopy Cover Standard:** development must meet locally defined targets for tree canopy cover. New and existing trees must be incorporated into new developments and new streets must be tree lined.

“...the quantity and quality of green infrastructure (GI) in our urban areas is of critical importance. It is not just an issue of wellbeing and economic benefits, but one of equity and distribution, too.” Natural Capital Committee (2015) [\[See reference 90\]](#)

7.22 Building with Nature (BwN) [\[See reference 91\]](#) is an additional evidence-based standard that defines high quality GBI. The Standard could be adopted by Thurrock Council as a benchmark for assessing and accrediting the quality of GBI delivered as part of development. Developers could be signposted to use the BwN Standards to create better places for people and wildlife. The Essex Green Infrastructure Standards make reference to the Building with Nature (BwN) standards, which suggests should be applied by “developers wishing to deliver exceptional sites”.

7.23 Thurrock Council could also encourage, or require, successful achievement of a BwN Award as a preferred mechanism for demonstrating a commitment to design and build quality. A BwN Award is an external verification that reassures a range of stakeholders that the benefits of high-quality green infrastructure will be more effectively secured at each stage of development,

including implementation and post-construction, and by requiring evidence of effective arrangements for long-term management and maintenance. Training is available if the Council wanted to develop in-house BwN expertise, or there is a UK-wide BwN approved assessor network.

Delivery mechanisms

7.24 In addition to Local Plan approaches listed above, there are a number of ways in which Thurrock Council can support GBI delivery.

Local Nature Recovery Strategy and Biodiversity Net Gain

7.25 The Environment Act 2021 requires local authorities to prepare a Local Nature Recovery Strategy. These must identify biodiversity priorities for the area and provide a local habitat map that identifies areas of importance for biodiversity. The Local Nature Recovery Strategy (LNRS) for Essex will build upon the information in this study, but will consider habitats and species, and opportunities to protect and enhance them in greater detail. Development of the LNRS will require partnership working, for example with the Local Nature Partnership. The LNRS will help to deliver GBI priorities as many of the projects identified in this study have a strong biodiversity focus.

7.26 The ‘process journey for local planning authorities’ within Natural England’s GI Framework shows how the stages in the preparation of GBI strategies, LNRS and local plans align (adapted in **Table 7.1**).

Table 7.1: The relationship between GBI Strategies, LNRS and Local Plans

GBI steps	Related LNRS steps	Related Local Plan steps
Partnerships	Appointment of responsible authority, governance, roles, responsibilities	
Vision informed by strategic context	Stakeholder engagement and plan, agreed vision.	Regulation 18 consultation
Evidence	Step 1: locally held data, national and local habitat maps Step 2: description of the area	Evidence gathering
Plan strategically and develop GBI policy and targets	Step 3: Outcome identification Step 4: Potential measures	Viability testing of policies, Regulation 19 publish preferred policies
Design	Step 5: Mapping opportunities Step 6: Statement of priorities	Inclusion in local design codes
Managed valued monitored and evaluated	Consultation, sign-off, monitoring and evaluation, review and revision	

7.27 BNG is also likely to be a powerful lever in delivering Thurrock's GBI network. BNG is now embedded within the Environment Act 2021. The Act requires a minimum of 10% biodiversity net gain from development sites in order to make space for nature and help create nature permeability within urban areas.

7.28 As a requirement of development sites, the delivery of biodiversity net gain requirement would be achieved as individual development sites come forward, through the development management process. The cost will therefore be borne by developers and landowners as a development requirement. It may be the case that for some development sites, delivery of BNG on site may not be feasible, resulting in more off-site compensation being required. This could be targeted to the environmental improvement areas identified within the LNRS.

7.29 The development of Local Plan policy on biodiversity net gain (BNG), including on what level of gain is required and where offsite habitat investment should be targeted, should be integrated with the GBI policies.

Green Belt release

7.30 The NPPF states that local authorities should plan positively to enhance the beneficial use of Green Belts including looking for opportunities to provide access, provide for outdoor sport and recreation; retain and enhance landscapes, visual amenity and biodiversity; and improve damaged and derelict land.

7.31 Where land is released from Green Belt for development, it is a requirement of the NPPF that compensatory improvements to the environmental quality and accessibility of remaining Green Belt land must be made. This could be used as a mechanism for delivering some of the GBI improvements, in conjunction with BNG and developer contributions.

7.32 National Planning Policy Guidance (NPPG) also endorses the preparation of supporting landscape, biodiversity or recreation evidence to identify appropriate compensatory improvements, including:

- New or enhanced green infrastructure;
- Woodland planting;
- Landscape and visual enhancements (beyond those needed to mitigate the immediate impacts of the proposal);

- Improvements to biodiversity, habitat connectivity and natural capital;
- New or enhanced walking and cycle routes; and
- Improved access to new, enhanced or existing recreational and playing field provision.

7.33 Beneficial uses could potentially be achieved through planning conditions or section 106 obligations. The NPPG stresses the need for early engagement with landowners and other interested parties to obtain the necessary local consents, establish a detailed scope of works and to identify a means of funding the design, construction and maintenance of any enhancements.

7.34 In addition to identifying measures to enhance the remaining land designated as Green Belt, when releasing sites the Council will also need to demonstrate that they have sought to mitigate potential harm to the Green Belt. Case law, as established in *Calverton Parish Council v Greater Nottingham Councils & others* (2015), indicates that planning judgments setting out the 'exceptional circumstances' for the amendment of Green Belt boundaries require consideration of 'the extent to which the consequent impacts on the purposes of the Green Belt may be ameliorated or reduced to the lowest reasonably practicable extent'. The extent to which harm to the Green Belt can be mitigated will vary from site to site, but potential measures could deliver GBI benefits e.g. the creation of a woodland belt to create a strong boundary feature.

Infrastructure planning

7.35 As part of the Local Plan process, Thurrock Council is preparing an Infrastructure Delivery Plan (IDP) for the borough, as well as place-based IDPs for strategic growth locations, which will identify the required community, transport, utilities and GBI required at that location, along with proposed funding delivery mechanisms. This GBI Strategy will inform the preparation of the IDPs.

7.36 The Council is also updating its transport evidence base, and multi-modal transport model and an updated walking and cycling strategy have both been commissioned.

Partnership working

7.37 The National GI Standards launched by Natural England in early 2023 highlight the importance of establishing a lasting partnership approach with a diverse and inclusive set of stakeholders when planning for GBI. That means embedding awareness of the multiple benefits of GBI across local authority departments and seeking to form robust delivery partnerships with external organisations and community groups.

7.38 It is important to consider what body or partnership will take on responsibility for overseeing delivery of the council's GBI ambitions. Third sector organisations already active in this space (e.g. Thames Chase Trust) may have a key role to play and/or the council might want to consider the feasibility of created a dedicated post to champion GBI delivery.

7.39 Partnership working is particularly relevant for proposals that cross administrative boundaries (boroughs, parishes, river catchments, land ownership) or areas of interest (e.g. flooding, biodiversity, landfill restoration, sustainable transport) for example:

- The Tilbury Country Park and Mardyke Valley Park, which would be part of the wider SEE Park proposals set out in the South Essex Green Infrastructure Strategy and deliver a range of benefits.
- Restoration of minerals and landfill sites for development and biodiversity.
- Catchment-wide flood risk management and/or farming practices.

7.40 The following are key organisations for partnership working in Thurrock:

- Biodiversity organisations and wildlife site managers: Buglife, Essex Wildlife Trust, Forestry England, Natural England, Plantlife, RSPB, The Land Trust, The Thames Chase Trust.
- Water management organisations: South Essex Catchment Partnership, Environment Agency, Essex and Suffolk Water company,
- Farming and rural land organisations: CPRE Essex, FWAG South East
- Transport organisations: Essex County Council as highways authority, Horse riding interest groups , National Highways, Sustrans and other cycling interest groups, Ramblers and other walking interest groups.
- Other owners and managers of sites in Thurrock: Historic England, Port of London Authority, other landowners and site developers.
- Neighbouring local authorities and neighbourhood planning groups.

Ongoing maintenance and ownership

“Considering the governance, funding, management, maintenance and monitoring of green infrastructure for the long term is important to lock in benefits, especially where these fall outside of planning requirements.”

GI Framework ‘process journey for local planning authorities’, 2023

7.41 Thurrock Council has a Public Land Maintenance Strategy, covering the period 2021-2027, setting out how it will maintain its own GBI assets.

7.42 Identification of a delivery body and funding source will need to ensure that provision is made for long term maintenance (and possibly monitoring) of GBI assets to ensure that they deliver expected benefits.

7.43 There may be opportunities to foster informal ‘sense of ownership’ by establishing or promoting community groups and opportunities in local green spaces.

Funding sources

7.44 The funding of GBI has often been a challenge, especially in areas with lower land values where development viability can be an issue. GBI is often seen only as a cost to developers, because GBI benefits are not as easily quantifiable as the economic returns for other ‘grey’ infrastructure investments. However, deliberate investment in the natural environment can produce economic, social and environmental benefits that are often unconsidered. It should be recognised that investment in GBI as part of high-quality design/place-making can contribute to higher sales values for developers, help to reduce local opposition to development, improve local health outcomes, and promote urban competitiveness.

7.45 By setting out clear GBI plans the council will be best placed to secure funding from multiple public and private sector sources, including from NSIPs. It will also enable the council to provide clarity to developers about GBI requirements so that they can factor these costs into the price paid for land.

7.46 Funding is available from different sources depending on what is being funded (type and stage of project), the benefits, and who is applying. A brief summary of funding sources available for GBI is provided below, with further details provided in **Appendix F**.

7.47 GBI can be provided as part of new development or funded through developer contributions. This can include the funding of strategic mitigation such as measures to reduce visitor pressure at European sites and off-site Biodiversity Net Gain. Councils can also apply for Levelling Up Funding for the improvement of urban greenspaces. Many of the GBI projects identified in this strategy could be at least partially funded via developer contributions of funds

applied for by the council; however, it is likely that some additional funding will be required to deliver and ensure ongoing maintenance of GBI.

7.48 The presence of NSIP proposals in Thurrock (LTC, GREEN) mean that, if schemes are permitted, some GBI enhancements could be delivered as part of the mitigation package. National Highways and National Grid both have additional funds available for enhancement projects that are in addition to mitigation, that could be used to fund GBI.

7.49 There is also a variety of funding available to land owners, land managers and delivery bodies, key examples are summarised below (see also **Appendix F**):

- Woodland creation grants such as the 'England Woodland Creation Offer', 'Woodland Management Plan Grant' and 'Woodland Tree Health Grant'.
- Farming and rural land management initiatives such as the emerging Environmental Land Management funds ('Sustainable Farming Incentive', and forthcoming 'Local Nature Recovery' and 'Landscape Recovery' funds); a new Countryside Stewardship grant ('Protection and Infrastructure' grant) also replaces an early Countryside Stewardship scheme.
- Other grants for specific projects e.g. National Lottery Heritage Fund, and the Evergreen Fund.

Chapter 8

Next Steps

8.1 This GBI Strategy Report has been prepared as part of the evidence base for the Thurrock Local Plan. It is intended that the principles within this Strategy guide the policies and site allocations within the Local Plan, alongside other evidence base studies. This work sets out the Council's GBI priorities at the time of writing. As further studies are completed, the Local Plan is updated, and other evidence is available, these priorities are likely to evolve.

8.2 As preparation of the Local Plan advances and sites for development are identified, the priorities and principles within this strategy could be used to develop specific guidance on GBI for those development sites (or clusters of sites).

8.3 As set out in Chapter 7, the use of design codes and GBI standards are emerging as a best practice means of delivering improvements in GBI. The development of locally appropriate standards and codes would benefit from a more detailed understanding of Thurrock's GBI assets. This could be achieved through the application of the GI Framework's area wide standards (for accessible greenspace, urban nature recovery, urban greening factor, and urban tree canopy cover), which would assist in quantifying the borough's baseline; as well as through a general review of Thurrock's GBI assets, for example as part of an updated open space study.

8.4 It is important to ensure that improvements to GBI are reflected across other strategies and plans, for example those relating to infrastructure, transport, wellbeing, climate change and air quality.

8.5 Thurrock Council will continue to engage with environmental organisations, consultees and developers, to ensure that opportunities to protect and enhance the GBI network are realised.

Appendix A

Data List and Bibliography

A.1 A list of data obtained for the GBI Strategy and documents that have informed the Strategy. Note that not all of the data has been presented in mapping within the Stage 1 report.

Data list

Table A.1: Data used in GBI maps

GIS layer	Source	Year dataset obtained
Base maps		
Ordnance Survey 50K	Thurrock Council	2022
Local authority boundaries	Ordnance Survey	2022
Ordnance Survey 1:250k	Ordnance Survey	2022
Landscape		
Landscape character types / areas	LUC for Thurrock Council	2016
Agricultural Land Classifications	Natural England	2019
Hydrology		
Watercourses / bodies	Ordnance Survey	2022

Appendix A Data List and Bibliography

GIS layer	Source	Year dataset obtained
Working With Natural Processes (WWNP) data (riparian woodland potential etc)	DEFRA	2020
Flood zone 2 and 3	Environment Agency	2022
Areas benefitting from flood defences	Environment Agency	2022
Historic environment		
Conservation areas	Thurrock Council	2022
Listed buildings	Thurrock Council	2022
Parks and gardens	Historic England	2022
Scheduled monuments	Historic England	2022
Heritage at Risk	Historic England	2022
Ecology		
Special Areas of Conservation (SAC)	Natural England	2022
Special Protection Areas (SPA)	Thurrock Council	2022
Ramsar	Natural England	2022
Sites of Special Scientific Interest (SSSI)	Natural England	2021
National Nature Reserves (NNR)	Natural England	2022
Local Nature Reserves	Thurrock Council	2022

Appendix A Data List and Bibliography

GIS layer	Source	Year dataset obtained
Priority Habitat Inventory (PHI)	Natural England / Thurrock Council	2022
Open mosaic habitat	Natural England	2017
Great crested new opportunity areas & risk zones	Thurrock Council / Natural England	2022
B-line (pollinator corridors)	Bug Life	2020
Network opportunities (restorable habitat, network enhancement zones etc)	Natural England	2022
Stewardship agreements (Environmental Stewardship & Countryside Stewardship)	Natural England	2022
Access and recreation		
Open spaces and typology	Thurrock Council	2022
ANGSt profile	Natural England (GI Mapping)	2022
Open space quality and value	Thurrock Council (Open Space Study)	2017
National and Regional Cycle Routes	Sustrans	2022
Local cycle routes	Thurrock Council	2016
Public Rights of Way (PRoW)	Thurrock Council	2022
PRoW Density	Natural England	2022
Railway	OS	2022

GIS layer	Source	Year dataset obtained
Health and wellbeing, socio-economic		
Index of Multiple Deprivation	Office of National Statistics	2019
Planning / other land use		
Green Belt	DCLG	2021
Thames Chase Community Forest	Thurrock Council	2022
Authorised landfill sites	Environment Agency	2020
Historic landfill sites	Environment Agency	2020

Bibliography

A.2 Thurrock Council documents:

- Consultation on Thurrock walking & cycling strategy, 2022
- Consultation on funding for new cycling / walking routes, 2021
- Climate Change Action Plan, 2021
- Green Belt Assessment Stage 1, 2019
- Thurrock GBI Strategy, 2019 (unpublished)
- Landscape Character Assessment, 2018
- Strategic Flood Risk Assessment, 2018
- Active Travel Strategy, 2017
- Thurrock Design Strategy SPD, 2017
- Coalhouse Fort Conservation Management Plan, 2017

Appendix A Data List and Bibliography

- Air Quality and Health Strategy, 2016
- Coalhouse Fort Park Management Plan, 2013-2016
- Thurrock Water Cycle Study Scoping Report, 2009
- Thurrock Biodiversity Study 2006-2011
- GreenGrid Strategy 2006-2011
- Community Needs and Open Spaces Study, 2005
- Public Land Maintenance Strategy

A.3 Other local authority documents:

- Brentwood GI Strategy, 2016
- Essex Design Guide, 2018
- Essex Green Infrastructure Strategy, 2020
- Essex Green Infrastructure Standards, 2022
- Essex Minerals Plan, 2014
- Gravesham GBI Strategy, 2022 (unpublished)
- South Essex Strategic Green & Blue Infrastructure Strategy, 2020

A.4 Documents from other organisations:

- Bird Aware Essex Coast: Essex Coast Recreational Disturbance, Avoidance and Mitigation Strategy, 2020
- Buglife: Brownfield sites under threat (webpage), 2022
- CPRE: Building on our food security, 2022
- CPRE/London Green Belt Council: Safe Under Us, 2022
- English Heritage: Tilbury Fort Conservation Plan draft, 2018
- Environment Agency: South Essex Catchment Flood Management Plan, 2009

Appendix A Data List and Bibliography

- Environment Agency: Thames Estuary 2100 Plan, 2012 (and later reviews)
- Environment Agency: Thames River Basin District, River basin management plan, 2015
- Forestry Commission Scoping Study, 2020 (unpublished)
- Highways England: biodiversity designated funds projects, 2022 (unpublished)
- Historic England: Heritage at Risk Register, 2022
- Natural England: Carbon storage and sequestration by habitat, 2021
- Natural England: Essex Natural Capital Atlas, 2021
- Natural England: Green Infrastructure Framework, 2023
- Planning Inspectorate: Lower Thames Crossing DCO application, 2022
- South Essex Catchment Partnership: potential projects (webpage), 2021
- Thames Chase Plan, 2014

Appendix B

Planning Policy Context

B.1 This section outlines the key national, regional and local policies that influenced this Strategy, together with a number of additional guidance documents relevant to GBI in Thurrock.

National policy

25 Year Environment Plan and Environmental Improvement Plan

B.2 The government's 25 Year Environment Plan [\[See reference 92\]](#), published in 2018, provided support for 'net environmental gain' in development, habitat creation, multi-functional SUDS requirements, and natural spaces close to where people live and work.

B.3 The Environmental Improvement Plan 2023 [\[See reference 93\]](#) updates the 25 Year Environment Plan and sets goals for environmental protection and improvement relating to biodiversity, air quality, water resources, pollution, climate change, resource use, landscape and heritage.

B.4 The 25 Year Environment Plan put forward the Green Infrastructure Framework, which has now been launched (see below)

Natural England's Green Infrastructure Framework

B.5 Launched in 2023, the National Green Infrastructure (GI) Framework for England is a set of tools intended to support the greening of our towns and cities and connections with the surrounding landscape as part of the Nature Recovery Network. The Framework is designed to help local planning authorities and developers meet requirements in the National Planning Policy Framework to consider GBI in local plans and in new development. It can support better planning for good quality GBI and help to target the creation or improvement of GBI, particularly where existing provision is poorest.

B.6 The Framework comprises the following tools:

- Green Infrastructure Principles: the what, what and how of good green infrastructure.
- Green Infrastructure Standards: guidance on national standards for green infrastructure quantity and quality.
- Green Infrastructure Maps: mapped environmental, socio-economic datasets to support the standards.
- Green Infrastructure Planning and Design Guide: practical, evidence-based advice on how to design good quality green infrastructure.
- Green Infrastructure Process Journeys: guides on how to apply all the products in the Green Infrastructure Framework.

National Planning Policy Framework

B.7 The National Planning Policy Framework (NPPF) underlines the importance of GBI and its relevance to the development of a Local Plan. Note that the NPPF has been updated since the draft Thurrock GBI strategy was prepared and will be subject to further changes in 2023.

B.8 Paragraph 92 states that planning policies and decisions should aim to achieve healthy, inclusive and safe places which enable and support healthy lifestyles, especially where this would address identified local health and well-being needs – for example through the provision of safe and accessible green infrastructure.

B.9 Paragraph 93 highlights that planning policies should be based on robust and up-to-date assessments of the needs for open space, sports and recreation facilities.

B.10 Paragraph 128 sets out a new need for all LPAs to prepare design guides or codes in accordance with the National Design Guide and National Model Design Code, and that represent local character and design preferences.

B.11 Paragraph 131 places greater emphasis on trees in new development. It states that trees make an important contribution to the character and quality of urban environments, and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined, that opportunities are taken to incorporate trees elsewhere in developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly-planted trees, and that existing trees are retained wherever possible.

B.12 Paragraph 145 highlights that local planning authorities should look for ways to improve defined Green Belt land's beneficial use, such as providing access, providing opportunities for outdoor sport and recreation, preserving and improving landscapes, visual amenity, and biodiversity, and improving damaged and derelict land.

B.13 Paragraph 153 states that Local Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing

space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.

B.14 Paragraph 175 of the NPPF states that Local Plans should take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.

B.15 Paragraph 179 addresses the importance of protecting and enhancing biodiversity and geodiversity through mapping the components of ecological networks.

B.16 Paragraph 180 (part d) places greater emphasis on improving biodiversity and public access to nature. It states that local planning authorities should consider development that has the primary goal of conserving or enhancing biodiversity should be supported; and opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or improve public access to nature where this is appropriate.

Planning Practice Guidance

B.17 National Planning Practice Guidance (PPG) encourages a strategic approach to implementing GBI in Local Plans through an evidence-based approach. It states that local authorities are required to provide suitable mitigation for potential impacts on European sites of nature conservation and recommends the provision of open space such as Suitable Alternative Natural Greenspace (SANG), either directly or through the Community Infrastructure Levy (CIL) [\[See reference 94\]](#).

The Environment Act

B.18 The Environment Act, which became law in 2021, is the UK's new framework for environmental protection. This Act intends to provide new, long-term environmental targets, including for air quality, water, biodiversity, and waste production.

B.19 The Act addresses both green and blue assets, with particular regard to nature and biodiversity. The Act requires biodiversity net gain to be a condition of planning permission in England, with developers required to deliver a minimum 10% biodiversity net gain before securing planning permission from late 2023. The approach must be consistent with the 'mitigation hierarchy' already set out in the NPPF (paragraph 180a).

B.20 Local Nature Recovery Strategies (LNRSs) are a new, England-wide system of spatial strategies that will drive nature's recovery and provide wider environmental benefits. LNRS areas (likely to be approximately county scale) and "responsible bodies" to lead preparation of each LNRS (working with public, private and voluntary stakeholders) are currently being agreed with Defra. Each LNRS will, for the area that it covers: agree priorities for nature's recovery; map the most valuable existing areas for nature; and map specific proposals for creating or improving habitat for nature and for wider environmental goals (e.g. net zero carbon, flood risk reduction, water quality). Any off-site BNG provision will carry extra weight if it is in a location identified in a LNRS.

B.21 The act also strengthens the existing duty on public authorities to "conserve" biodiversity [See reference 95] in the NERC Act 2006, adding "enhancing"; and introduces a new requirement for local authorities to produce a biodiversity report every five years (describing action taken and its impact).

National Design Guide

B.22 This guide [\[See reference 96\]](#) sets out the Government's priorities for well-designed places in the form of ten characteristics: context, identity, built form, movement, nature, public spaces, uses, homes and buildings, resources and lifespan. This reflects the government's priorities and provides a common overarching framework for design.

B.23 The National Design Guide highlights the importance of green infrastructure in relation to both the characteristics of Movement and Nature. It states that a well-designed movement network defines a clear pattern of streets that incorporates green infrastructure, including street trees to soften the impact of car parking, help improve air quality and contribute to biodiversity.

B.24 Regarding the characteristic of Nature, the National Design Guide states that design should aim to provide a network of high quality, green open spaces with a variety of landscapes and activities, including play. It specifies that well-designed places provide usable green spaces, taking into account their potential to contribute to a strategic green infrastructure system, and to water management.

National Model Design Code

B.25 The National Model Design Code [\[See reference 97\]](#) expands on the ten characteristics of good design set out in the National Design Guide, setting out clear design parameters to help local authorities and communities decide what good quality design looks like in their area.

B.26 It sets a baseline standard of quality and practice which local planning authorities are expected to take into account when developing local design codes and guides and when determining planning applications. This includes how landscape, green infrastructure and biodiversity should be approached including the importance of streets being tree-lined. Design codes are expected

to include design of green infrastructure, play spaces, SUDS and the protection of biodiversity. The National Model Design Code states that all development should enhance the natural as well as the built environment, this includes green infrastructure, water and drainage and biodiversity; that new development should contribute towards the creation of a network of green spaces and facilitate access to natural green space where possible.

Net Zero Strategy: Build Back Greener

B.27 This strategy aims to support existing industry to decarbonise and encourage the growth of new, low carbon industries to protect and create skilled jobs and businesses in the UK encouraging long-term investment in home-grown decarbonisation technology. The strategy builds in the Prime Minister's 10 Point Plan for a Green Industrial Revolution and sets out the government's vision for the manufacturing and construction sector and is part of the government's path to net zero by 2050.

B.28 The strategy aims to reduce emissions by two-thirds in just 15 years and support up to 80,000 jobs over the next thirty years. It recognises that land use change, such as woodland creation and management, will be important for achieving net zero. It also highlights the need to ensure action for net zero is compatible with wider uses of land such as agriculture, housing, infrastructure and achieving wider environmental goals such as nature recovery.

Levelling-up and Regeneration Bill

B.29 The Bill [\[See reference 98\]](#) sets out a direction of travel for planning reform and supports the levelling up agenda. It seeks to streamline the planning process, most notably through the introduction of national development management policies, while attaching greater weight to development plans.

B.30 Key reforms in the Bill include the replacement of the Environmental Impact Assessment and Strategic Environmental Assessment regime with a

new system of environmental assessment; Environmental Outcomes Reports (EORs). This section of the Bill allows the Secretary of State to make regulations to set “specified environmental outcomes” against which consents and plans will be assessed, and repeal/amend existing environmental assessment legislation.

B.31 Another key reform detailed in the Bill is the replacement of the current system of developer contributions with a new non-negotiable Infrastructure Levy charge to deliver the infrastructure that new developments require. The new levy will be set locally, with financial contributions based on the gross-value of the property when sold, rather than on floorspace. To help protect and ensure the validity of levy charges, section 204Q of the Bill will require all Local Authorities to produce an ‘Infrastructure Delivery Strategy’ that sets out how financial assets raised through the levy will be used to provide needed infrastructure in their area. It will be important to include GBI in this strategy.

B.32 The Bill also looks to introduce added protection for heritage assets through the implementation of national ‘General Heritage Protection Policies’. This will form part of the general streamlining process to plan-making and has the potential to greatly improve protection of heritage assets. In addition, for the first time, there will be a general duty for planning authorities to ensure special regard is given to the preservation or enhancement of affected heritage assets and their significance and setting in planning applications.

B.33 The Bill was introduced to Parliament on 11 May 2022. At time of writing, and in-depth consultation period is about to begin, with this expected to last until Spring 2023.

Regional policy

South Essex Plan

B.34 The South Essex Plan, the Joint Strategic Plan for the South Essex authorities, was intended to provide strategic policy direction on a variety of matters including GBI. [\[See reference 99\]](#); however, it is now intended to replace this with a non-statutory strategic framework.

The South Essex Strategic Green and Blue Infrastructure (GBI) Study

B.35 The South Essex Strategic GBI Study analyses the supply of existing Greenspace and Waterways across South Essex. The Study defines an integrated Green And Blue Network, that will provide multiple benefits and which merits prioritisation and significant investment, and will guide Local Plans. The Study identifies short-term opportunities (2020 - 2025), such as developing Fobbing Marshes to provide green space for residents, and connect to Thurrock Thameside Nature Reserve, as well as long-term opportunities (2025 - 2050), including an expansion of Thurrock Thameside Nature Reserve to 845 acres.

B.36 The study also includes a bold proposal for the creation of South Essex Estuary (SEE) Park. It is proposed that SEE Park will comprise a network of diverse green and blue assets threading through an area of approximately 70,000 hectares. This area will include new recovery sites, including flood zones and former industrial, mineral, and extraction sites.

Essex Green Infrastructure Strategy

B.37 This strategy [See reference 100] advocates for high-quality green space and green infrastructure in Essex. The aim of this strategy is to adopt a proactive approach to enhancing, protecting, and creating a comprehensive network of high-quality green infrastructure across Greater Essex. This will aid in the creation of a county-wide awareness of green infrastructure, its functions, and values, as well as the identification of green infrastructure delivery options.

Fit for the Future: The Physical Activity and Sport Strategy for Essex, Southend and Thurrock 2021-2031

B.38 The strategy [See reference 101] aims to achieve widespread behaviour change to create an active Essex to improve all citizens health and wellbeing. It also aims to enable co-working of people and organisations across systems to make physical activity a part of everyday life for everyone.

B.39 The strategy highlights as key to achieving this supporting those who are already active and tackling inequalities that currently prevent people from an active lifestyle. In addition the strategy states a bottom-up, place-based approach is needed, as well as opportunities for personal development and sharing learning.

Essex Joint Health and Wellbeing Strategy 2018-2022

B.40 This strategy [See reference 102] is intended to set 'a small number of key strategic priorities for action', where there is an opportunity for partners to 'have a real impact' through local initiatives and action. The overall aim of the

strategy is an improvement in health and wellbeing outcomes for people of all ages and a reduction in health inequalities by having a focus on supporting poor health prevention and promoting health improvement.

Local policy

B.41 Thurrock Council began work on its Local Plan under the previous Local Development Framework (LDF) system in 2005, which led to the adoption of the Thurrock Core Strategy and Policies for Management of Development (the Core Strategy) in December 2011, and subsequently the adoption of the Focused Review: Consistency with National Planning Policy Framework in 2015. The Core Strategy and the focused review together set out the spatial vision, strategy and planning policies for Thurrock up to and beyond 2026.

B.42 The Core Strategy is a statutory planning document that contains planning policies on topics such as housing, employment, green belt, community facilities, education and health, sports and leisure, open space, climate change, minerals and waste. It allocates only large sites for development considered pivotal for the future of Thurrock (i.e. of 'strategic importance').

B.43 Since the Core Strategy was adopted, there have been a number of significant changes to the planning system at a national, regional and local level, including those which have brought increased focus to housing delivery, such as the Housing White Paper [\[See reference 103\]](#). In February 2014, Thurrock Council made the decision to begin work on preparing a new Local Plan for the Borough, which will replace the Core Strategy, take the above changes into account and progress with site-specific allocations. Other previously proposed plans, including the Gypsy and Traveller Local Plan, will be combined into the new Local Plan.

B.44 The first Local Plan Issues and Options (Stage 1) was published for consultation in February 2016 while the second Local Plan Issues and Options (Stage 2) consultation took place from December 2018 to March 2019. Following on from this consultation, the Council piloted the Prince's Foundation

Design Charette in Aveley in late 2019. In early 2020, the Council rolled out this process to other locations to work with local stakeholders to build a better understanding of the need and opportunities for growth and investment throughout the Borough. This exercise was severely delayed as a result of the COVID-19 pandemic and was formally completed in March 2022.

B.45 The Council intends to undertake an additional two rounds of consultation under the Regulation 18 stage before proceeding to Regulation 19 consultation. The first Regulation 18 consultation is intended to commence in October 2022 and will look at the Council's preferred approach to the spatial strategy and strategic policies. The second Regulation 18 document will focus on detailed policies, spatial planning areas and individual sites – anticipated to take place in July 2023. The anticipated date for consultation on the Pre-Submission Local Plan (Regulation 19) is July 2024 with the submission of the Local Plan to the Secretary of State anticipated in autumn 2024.

B.46 The Local Plan will be guided and underpinned by the following principles:

- Delivering the right infrastructure in the right place and at the right time.
- Delivering positive health and wellbeing impacts.
- Meeting Thurrock's housing needs.
- Protecting and enhancing the character of existing communities.
- Minimising carbon emissions.
- Maintaining an effective Green Belt.
- Protecting and delivering quality in the built environment.
- Meeting employment needs.
- Ensuring our town centres continue to thrive.
- Respecting the River Thames.
- Managing waste.

B.47 The Local Plan will set out the amount and location of new development across the Borough in the period up to 2040. It will address Borough-wide strategic issues such as the quantity and quality of new homes, jobs, services and infrastructure, as well as detailed planning issues such as allocating specific sites for new development.

B.48 This GBI Strategy is a vital component of the Local Plan evidence base. The principles of the GBI Strategy will inform policy development within the Council's Local Plan, ensuring that the Vision (see Chapter 2) for Thurrock's GBI network is realised. The projects identified through the GBI Strategy will inform the development of the Council's Infrastructure Delivery Plan (IDP). The GBI Strategy offers the opportunity for identified projects to be developed further and included within the IDP (and future 'Infrastructure Delivery Strategy') – aiding in their financing and delivery alongside development.

Climate Emergency 2019

B.49 Thurrock Council declared a Climate Emergency in October 2019. This motion was carried for the Council to reduce its net CO2 emission to zero by 2030. There is a programme of work currently underway to evaluate that target, and establish the activity required to meet it. Thurrock Council's Local Plan, Carbon Management Plan, and Climate Local Plan, are undergoing review, and will include revisions regarding the targets set for this area, and further to this, the Council are in the process of developing a Climate Change Strategy for the borough.

Other relevant guidance and strategies

Thames Chase Plan 2014

B.50 The Thames Chase Plan establishes the Strategy for Community Forest Delivery between 2014 and 2024. It aims to develop, strategic woodland,

habitats and access on a forest-wide scale with an emphasis on Forest delivery. The Plan area extends into part of Thurrock Borough and identifies a number of project opportunities in the Borough, including:

- Improving river corridor links along the Mardyke.
- Landfill and quarry remediation.
- Improving the setting and integration of South Ockendon.
- Mardyke Valley Country Park.

B.51 The Thames Chase Trust aims to make the Thames Chase Community Forest an inspirational example of landscape regeneration and has plans to extend the Forest. As part of the National Community Forest Network it has become part of the Government's Tree Strategy and received grant funding through the Trees for Climate project. The Trust is also working with the Mayor of London on improving London's green infrastructure; and is taking forward the legacy of a major Heritage Lottery Fund partnership scheme 'The land of the Fanns'.

Thurrock Greengrid Strategy 2005-2011

B.52 The Thurrock Greengrid Strategy was completed in 2006 and incorporated an Open Space Strategy, Biodiversity Study and Green Infrastructure Framework Plan for the Borough. The broad aims of the Green Infrastructure Framework Plan were to identify and map the sites and features that make up green infrastructure within Thurrock, and to identify the potential for new and enhanced assets in order to improve the functionality of the Thurrock Greengrid. Since the Greengrid Strategy was published, the green infrastructure and development context has changed significantly and this Strategy provides an updated evidence base and GBI enhancement proposals.

Thames Estuary 2100 Plan

B.53 The Environment Agency developed the Thames Estuary 2100 Plan (TE2100) to recommend how to manage tidal flood risk to the end of the century and beyond. There are three 'action zones' within the TE2100 plan covering the Thurrock area: Action Zone 5 – middle Estuary; Action Zone 6 lower Estuary Marshes; and Action Zone 7 – lower Estuary, urban/industrial and marshland. The actions concerning Thurrock are summarised in Chapter 5.

B.54 A 10-year review of the Plan was completed in 2021. The 10-Year Review is an opportunity to reflect on an improved understanding of climate change impacts, updating the Plan as new data, scientific evidence, and climate change projections become available. An updated Plan is expected to be published in 2022.

GI strategies of neighbouring authorities

B.55 Most of the local authorities neighbouring Thurrock have not published individual GI strategies, and instead use the South Essex Green Infrastructure Strategy and Essex Green Infrastructure Strategy (see Regional policy, above). The exceptions are set out below.

Brentwood Green Infrastructure Strategy 2015

B.56 The Strategy provides framework for Brentwood Council to deliver GI. It sets out a number of opportunity sites, including Dunton Garden Suburb, Brentwood Enterprise Park, Thriftwood Scout Camp and the delivery of greenways across Brentwood.

Gravesham Green and Blue Infrastructure Study 2022

B.57 This study was completed by LUC in 2022 and has not yet been published by the council.

Thames Freeport

B.58 A bid backed by Thurrock Council to create a Thames Freeport was successful in 2021. The Thames Freeport is a 34km wide economic corridor that will deliver more than 21,000 new jobs and investment close to existing ports. It is intended as an innovation hub, that will attract investment and government funding.

Active Place Strategy 2020

B.59 The Active Place Strategy provides key policy recommendations to manage the Borough's open space, and create a network of high quality, accessible, and sustainable sport and leisure facilities.

B.60 Active travel data [\[See reference 104\]](#) has identified the need for active travel in Thurrock to tackle the Climate Emergency and improve physical health. Carbon dioxide emissions from road transport made up 99.5% of total transport emission in 2018, whilst walking levels are significantly below the England average and neighbouring local authorities.

Thurrock Air Quality and Health Strategy 2016

B.61 Thurrock's Air Quality and Health Strategy aims to tackle the health problems associated with and exacerbated by air pollution within the borough.

As part of this strategy, the opportunity has also been taken to review the existing Air Quality Action Plans (AQAPs) associated with Thurrock's 18 AQMAs.

B.62 The Air Quality Evidence Base highlights the prevalence of air quality issues in the borough, in relation to two regulated air pollutants - Nitrogen Dioxide (NO₂) and Particulate Matter (PM₁₀), which are particularly concentrated in the west along primary transport corridors supporting the designation of 18 Air Quality Management Areas (AQMA) in Thurrock.

B.63 Since this Strategy was published, the Air Quality & Health Strategy and Modelling Assessment Update was released in 2020. This Update reviews the existing Air Quality Strategy for Thurrock, considering the roles and actions to be taken by different services in the Council.

Essex Coast Recreational disturbance Avoidance & Mitigation Strategy (RAMS)

B.64 The Essex Coast RAMS aims to deliver the mitigation necessary to avoid significant adverse effects from 'in-combination' impacts of anticipated residential development across Essex. The strategy requires all residential development within a 'zone of influence' of the Essex Coast SPA/Ramsar/SAC sites to contribute to a tariff that will fund Strategic Access Management and Monitoring at the sites.

Thurrock Climate Scoping Report - Recommendations for Planning

B.65 Thurrock Council's Climate Change Scoping Report recognises climate commitments in Thurrock, and defines the requirements for a climate change

strategy based on Thurrock's current climate impact existing legislation, policy and other requirements around climate.

South Essex Catchment Plan 2015 - 2018

B.66 The South Essex Catchment Plan seeks to improve the physical functioning and condition of the rivers and tributaries within the South Essex Catchment, to benefit wildlife and people. This Plan was produced by the South Essex Catchment Partnership, a group is comprised of local stakeholders.

Appendix C

2019 GBI Strategy

C.1 Sections of the draft GBI Strategy that will be revisited at next stage:

- Chapter 7: Strategic GBI Projects
- Chapter 8: Implementation and Delivery
- Appendix 1: Strategic GBI Proposals - Green Infrastructure Projects
- Appendix 2: Strategic GBI Proposals - Blue Infrastructure Projects
- Appendix 3: Strategic GBI proposals – GBI in Growth Locations
- Appendix 4: Stakeholder Consultation

Appendix D

Review of 2019 proposals

D.1 Chapters 3-5 of this report describe the features of Thurrock's GBI network and pressures and priorities that drive the need for new or improved GBI. These have been updated to reflect the circumstances at the time of writing.

D.2 This information (gathered in June 2022) has been used to appraise the GBI proposals identified in the 2019 draft GBI Strategy, and to consider which of those proposals will need to be revisited at the next stage of this work. The appraisal is presented in the table below.

Proposal and description	Changes to context/baseline	Relationship to other strategic proposals (e.g. South Essex GBI, NSIPs)	Work required at next stage
Green infrastructure projects- Sub-regional and Borough level GI			
Mardyke Valley Country Park Provide a large-scale recreational resource within the Mardyke Valley to promote the health and wellbeing of nearby communities, notably South Ockendon and Grays. The project involves conserving and enhancing biodiversity and historic landscapes within the valley, as well as creating a coordinated network of PROW, spaces for recreation and areas for wildlife. The creation of the park would also involve enhancement to blue infrastructure, such as implementation of SuDS and creating areas for water-based recreation.	Water quality has deteriorated since the draft GBI Strategy was prepared, with additional failures relating to chemical pollutants. Thurrock Council has commissioned a concept design for improvements to the Mardyke Valley. Improvements to cycling and walking connections have been identified and proposed as part of the borough's Active Travel study. Thames Chase Community Forest is expanding, with the planting of new woodland. The Mardyke Valley and Brentwood Parklands form the eastern part of the Forest. The Lower Thames Crossing proposals, including mitigation around the Mardyke Valley, have developed but have not yet been confirmed via a submitted application.	This project is identified as one of five large scale landscapes framing the SEE Park outlined in the South Essex Strategic GBI study. Initiatives are already underway in the Mardyke Valley to promote green travel, and habitat creation, and connect with the Thames Chase Community Forest. The proposed Lower Thames Crossing crosses the valley to the northeast of South Ockendon.	Proposal will be retained but updated to reflect concept design work and Lower Thames Crossing proposals.
East Tilbury Country Park Create a new country park in the area between East Tilbury/Linford and Chadwell St Mary to promote health and wellbeing of these communities and people further afield. The project involves providing a network of PROW, spaces for recreation, areas for wildlife and possibly downgrading of roads to make them more pedestrian and cycle friendly. Connections across the Lower Thames Crossing and between the surrounding settlements will be key elements of the park.	More recent information is now available on access to natural greenspace, which highlights the deficiency in access in the east of Grays and near Tilbury; strengthening the justification for new or improved greenspace in this area. The Essex Coast Recreational disturbance Avoidance & Mitigation Strategy has been published, which highlights the sensitivity of the adjacent SPA/Ramsar to visitor pressure. Any increase in access to this area will therefore need to ensure that visits to sensitive sites to does not increase. Visitors could be drawn away from the SPA/Ramsar by improving accessibility elsewhere (a similar principal to SANGs – suitable alternative natural greenspace). The Lower Thames Crossing proposals, including the proposed motorway through this area and associated mitigation, have developed but have not yet been confirmed via a submitted application. Proposals for the GREEN are emerging.	NSIP GREEN intersects with this location. The Lower Thames Crossing proposals would result in the new motorway emerging from a tunnel in this area. The proposals include a new open space around the tunnel entrance, but may not be compatible with the concept of a country park. This location is identified within the South Essex Strategic GBI study as part of a 'regional parkland'; a key component of the SEE Park, which would join it to marshland to the east.	Proposal will be revisited in light of changes to the context. The project area will be refined to reflect the sensitivity of the adjacent SPA/Ramsar and the LTC proposals. Proposal could include 'with NSIPs' and 'without NSIPs' options.
Fobbing Marshes Nature Park Create a Nature Park at Fobbing Marshes and provide comprehensive management for all large areas of coastal floodplain and grazing marsh for wildlife with recreation and educational opportunities. The project would enhance the quality and connectivity of habitats in this area while offering enhanced access to nature. The park would provide links to Wat Tyler Country Park to the East to form part of a larger strategic resource for nature conservation.	More recent information is now available on access to natural greenspace, which highlights the deficiency in access around Corringham; strengthening the justification for new or improved greenspace in this area. Emerging review of the TE2100 Plan may include changes in this area.	This location is identified within the South Essex Strategic GBI study as part of a 'regional parkland'; a key component of the SEE Park, which would join it to marshland to the east.	Proposal will be retained and checked against changes to baseline and context.

Proposal and description	Changes to context/baseline	Relationship to other strategic proposals (e.g. South Essex GBI, NSIPs)	Work required at next stage
Tilbury Fort Park – Enhance the setting of and access to Tilbury Fort and create new park around the fort. The project would promote the heritage significance of the fort and provide a new recreational resource for Tilbury. The park would help to enhance the significance of Tilbury Fort, and provide a new recreational resource for Tilbury, thereby encouraging people to take part in more outdoor recreation and improve the health and wellbeing of residents. Improved management of the surrounding area will also enhance the landscape quality and biodiversity value of the historic grazing marshes.	Tilbury 2 has been granted development consent and the Tilbury Energy Centre application has been withdrawn. The Lower Thames Crossing proposals, including the proposed motorway close to the fort, and associated mitigation, have developed but have not yet been confirmed via a submitted application. More recent information is now available on access to natural greenspace, which highlights the deficiency in access in the east of Grays and near Tilbury; strengthening the justification for new or improved greenspace in this area. Proposals for the England Coast Path between Tilbury and Southend-on-Sea have been approved. Improvements to cycling and walking connections have been identified and proposed as part of the borough's Active Travel study.	The Lower Thames Crossing proposals would result in the new motorway emerging from a tunnel close to the fort (and between it and Coalhouse Fort). The South Essex GI Strategy notes that London's only deepsea cruise terminal is at Tilbury and that more could be made out of this opportunity (such as attracting tourism) by working the terminal into the green and blue network- for example, linking to Tilbury Fort, and Coalhouse Fort.	Proposal will be retained and checked against changes to baseline and context.
Green infrastructure projects – Green links			
Grays – Tilbury Station – Tilbury Fort Provide a safe, attractive route for pedestrians and cyclists from Grays to Tilbury Fort, via Tilbury Station. The link would enhance access along the river by providing a missing section of NCR 13 and extending the Thames Estuary path further into Grays.	A similar proposal has been included in the Council's planned cycle improvements. The proposals are currently being worked up by Thurrock Council but are not yet confirmed. Proposed route of England Coast Path west of Tilbury not yet known.	Proposal broadly reflected in the South Essex GI Strategy, which includes a coast path linking these locations.	Proposal will be revisited in light of any progress made by the Council at the next stage of the GBI Strategy.
Two Forts Way Improve and promote the Two Forts Way, improving accessibility along the riverside and to Coalhouse Fort. Development of the link would be in tandem with enhanced flood defences.	A similar proposal has been included in the Council's planned cycle improvements. The current status of the project is not yet known. Proposals for the England Coast Path between Tilbury and Southend-on-Sea have been approved. Route is part of NCN 13. Lower Thames Crossing proposals including significant work in this area have developed but have not yet been confirmed via a submitted application.	The proposed Lower Thames Crossing passes between the two forts, but the right of way would be retained. Proposal broadly reflected in the South Essex GI Strategy, which includes a coast path linking these locations.	Proposal will be retained and checked against changes to baseline and context (e.g. LTC proposals).
Coalhouse Fort – Wat Tyler Country Park Provide a safe and attractive PROW between Coalhouse Fort and Wat Tyler Country Park via the London Gateway, as well as protecting the sensitive biodiversity at Thames Estuary and Marshes SPA and Ramsar site. The new route would enhance access to nature as the route travels through an area of significant wildlife interest.	A similar proposal has been included in the Council's planned cycle improvements. The current status of the project is not yet known. Part of route is designated as NCN 13.	The South Essex GI Strategy identifies connections to Wat Tyler Country Park as important, but does not define specific routes. It says that "as the marshlands grow around the park, a network of trails and other facilities will be improved."	Proposal will be retained and checked against changes to baseline and context (e.g. progress improving cycling infrastructure)

Proposal and description	Changes to context/baseline	Relationship to other strategic proposals (e.g. South Essex GBI, NSIPs)	Work required at next stage
Grays – Chadwell St Mary – Stanford-le-Hope Provide and promote a new pedestrian and cycle link between Grays and Stanford-le-Hope, via Chadwell St Mary. The link is located on a desire line between Stanford-le-Hope/Corringham and Grays. As such, establishing this link would encourage residents of these settlements to cycle to work, as well creating a route for recreation. The route would also provide access to the proposed East Tilbury Country Park, if implemented.	Several components of a link between Grays and Stanford le Hope have been included in the Council's planned cycle improvements, including improvements to Orsett Cock roundabout, which could make a more northerly route preferable. The current status of these proposals is not yet known. Lower Thames Crossing proposals, which would bisect this route, have developed but have not yet been confirmed via a submitted application. Proposals for the GREEN are emerging.	If the Lower Thames Crossing goes ahead, a new link would need to make use of one of the proposed crossings. The South Essex GI Strategy also includes links between Chadwell St Mary and Stanford le Hope, but via different routes.	This proposal will be reviewed to consider whether broad route alignment in South Essex Strategy may be more appropriate.
Purfleet-Aveley-Belhus Woods Country Park Provide a safe and attractive active travel route between Aveley and Purfleet with connectivity to the Mardyke Valley Country Park and Belhus Woods Country Park. The link would help to encourage commuting by bicycle between Aveley and Purfleet and enhance access to nature for settlements along the route.	Links between Purfleet and Aveley have been included in the Council's planned cycle improvements. The current status of the project/s is not yet known. Thurrock Council has commissioned a concept design for improvements to the Mardyke Valley and at Aveley Landfill. Thames Chase Community Forest is expanding, with the planting of new woodland. The Mardyke Valley and Brentwood Parklands form the eastern part of the Forest. The Lower Thames Crossing proposals, including mitigation around the Mardyke Valley, have developed but have not yet been confirmed via a submitted application.	This is broadly in line with the South Essex GI Strategy, which includes improved cycling and walking connections through and to 'Mardyke Valley and Brentwood Parklands (part of the Thames Chase Community Forest): A sweep of landscape scale infrastructure connects Brentwood and Thurrock in a broad stroke from north to south.'	Proposal will be retained and checked against changes to baseline and context (e.g. progress improving cycling infrastructure)
Corringham - Langdon Hills Country Park Enhance the PROW between Corringham and Langdon Hills Country Park, making this accessible to cyclists as well as pedestrians. The enhanced link would encourage use of Langdon Hills Country Park for residents of Corringham, particularly those in the north, with benefits for health and wellbeing.	Route designated as NCN 13	No specific proposals within this area.	Proposal no longer required in previous form, although access in this area will be considered in relation to proposed development in this location and the sensitivity of Langdon Ridge SSSI to visitor pressure
Blue infrastructure projects			
Grangewaters Protect and enhance the facilities and activities at Grangewaters Outdoor Education Centre, as well as improvements to biodiversity within waterbodies.	The Lower Thames Crossing proposals, which would be nearby, have developed but have not yet been confirmed via a submitted application. Thames Chase Community Forest is expanding, with the planting of new woodland. The Mardyke Valley and Brentwood Parklands form the eastern part of the Forest.	The latest Lower Thames Crossing show that the road passing Grangewaters is within the order limits (ie likely to be used during construction) but there are no other proposals near it. Grangewaters falls within the area identified in the South Essex GI Strategy as 'Mardyke Valley and Brentwood Parklands'. The strategy refers to an opportunity to 'Enhance	Proposal will be retained and checked against changes to baseline and context (e.g. proposals in the South Essex GI Strategy)

Proposal and description	Changes to context/baseline	Relationship to other strategic proposals (e.g. South Essex GBI, NSIPs)	Work required at next stage
		recreational and biodiversity value of still water bodies along the valley’.	
Lakes at Belhus Woods Country Park Conserve and enhance opportunities for water-based recreation and biodiversity and Belhus Country Park. Currently there is a small network of lakes within the Belhus Woods Country Park. These currently provide fishing, conservation and hobby (e.g. model boat) facilities.	The Lower Thames Crossing proposals, which would be nearby, have developed but have not yet been confirmed via a submitted application. Thames Chase Community Forest is expanding, with the planting of new woodland. The Mardyke Valley and Brentwood Parklands form the eastern part of the Forest.	Belhus Woods falls within the area identified in the South Essex GI Strategy as ‘Mardyke Valley and Brentwood Parklands’. The strategy refers to an opportunity to ‘Enhance recreational and biodiversity value of still water bodies along the valley’.	Proposal will be retained and checked against changes to baseline and context (e.g. proposals in the South Essex GI Strategy)
Lakeside Expand and create opportunities for water-based recreation and biodiversity at Lakeside. Two areas of water, one acting as a feature of the Lakeside shopping centre and the other separated from Lakeside by the A1306. Expand engagement with these water spaces through low key opportunities for blue engagement, such as zorbs, stand-up paddle boards, splash pools, or an inflatable water park, as well implement biodiversity enhancements.	Plans to expand Lakeside were approved by Thurrock Council but the developer went bust. There are no current proposals to redevelop the site. Thurrock Council has commissioned a concept design for improvements to the nearby Mardyke Valley.	Lakeside is close to but not part of the area identified in the South Essex GI Strategy as ‘Mardyke Valley and Brentwood Parklands’.	Proposal will be retained and checked against changes to baseline and context (e.g. proposals in Mardyke Valley)
Thurrock Yacht Club Provide a safe, attractive focal point for waters sports, boating and leisure activities at Thurrock Yacht Club by improving facilities and supporting infrastructure.	A Grays – Tilbury Station – Tilbury Fort link (see above) would complement improvements to this site. The Essex Coast Recreational disturbance Avoidance & Mitigation Strategy has been published, which highlights the sensitivity of the adjacent SPA/Ramsar to visitor pressure (which could include activities on the water).	The South Essex GI Strategy promotes ‘opportunities for people to engage with the water’ but does not identify specific proposals in this location.	Proposal will be retained and checked against changes to baseline and context (e.g. Essex Coast RAMS)
Infrastructure to support enhanced river transportation Utilise and improve existing infrastructure to support an enhanced river transportation network, improving access to and from central London.	Proposals to improve cycling and walking facilities along the estuary been included in the Council’s planned cycle improvements. The current status of the project/s is not yet known. Proposals for the England Coast Path between Tilbury and Southend-on-Sea have been approved. Route is part of NCN 13. Lower Thames Crossing proposals including significant work in this area have developed but have not yet been confirmed via a submitted application. The Gravesham GBI Study has been completed.	The proposed Lower Thames Crossing passes between the two forts, but the right of way would be retained. Improved access is reflected in the South Essex GI Strategy, which includes a coast path linking these locations, but there are no specific proposals relating to river transport. The Gravesham GBI Study also identifies the need to improve the Tilbury-Gravesend river crossing (e.g. increased frequency).	Proposal will be retained and checked against changes to baseline and context (e.g. development of proposals relating to the right of way)
Additional leisure moorings Increase the number of leisure moorings in Thurrock. This will involve a review of river characteristics to identify suitable locations for	The Essex Coast Recreational disturbance Avoidance & Mitigation Strategy has been published, which highlights the sensitivity of the adjacent SPA/Ramsar to visitor pressure (which could include activities on the water).	The South Essex GI Strategy promotes ‘opportunities for people to engage with the water’ but does not identify specific proposals in this location.	Proposal will be retained and checked against changes to baseline and context (e.g. Essex Coast RAMS)

Proposal and description	Changes to context/baseline	Relationship to other strategic proposals (e.g. South Essex GBI, NSIPs)	Work required at next stage
leisure moorings to be used by visitor or potentially annual berth holders.			
EA Flood Defence Infrastructure Work with the Environment Agency to enhance spatial flood defences with particular attention to enhancing biodiversity and increasing links or access to water, as opposed to creating a hard buffer between blue and green zones. Key to this project will be delivering the actions within the TE2100 Plan and maximising the multi-functionality of flood defences provided as part of the Lower Thames Crossing.	The UK Chancellor announced plans to increase funding for flood defences to £5.2bn in the Budget 2020. The Thames Estuary 2100 underwent a ten year review in 2021. Updated recommendations will be published as part of the updated Thames Estuary 2100 Plan in 2022. Lower Thames Crossing proposals including proposals close to the Thames and Mardyke, and flood risk mitigation have developed but have not yet been confirmed via a submitted application. Proposals for the GREEN are emerging.	Plans for Lower Thames Crossing cross EA proposals along the Thames estuary, north of Tilbury, and the Mardyke. The NSIP GREEN intersects with EA flood defence infrastructure plans north and south of East Tilbury and north west of Bulphan The South Essex GI Strategy identifies the potential for flood alleviation through GBI, along the Mardyke and Thames marshes; the management of water is a key theme throughout the strategy. Within the Mardyke valley, it identifies as a priority ‘Enhance spatial flood defences along the valley such as by introducing large-scale SuDs. This should aim to create and enhance grazing marsh and other wetland habitats’	Proposal will be revisited in light of changes to the context. In particular, any changes emerging from the TE2100 review.
GBI in growth locations			
GBI in growth locations Make green infrastructure integral to any new development and exploit opportunities to enhance the blue infrastructure network in Thurrock, including links to the surrounding countryside and strategic GBI projects listed above.	Proposals in the Local Plan are emerging and growth locations may change. Lower Thames Crossing proposals have developed but have not yet been confirmed via a submitted application. Proposals for the GREEN are emerging. More recent information is now available on access to natural greenspace, from Natural England mapping. Thurrock’s Strategic Green Belt Assessment (Stages 1a and 1b) has been completed.	The South Essex GI Strategy incorporates the growth locations published in the Thurrock Issues & Options consultation. It states that ‘Growth and development will be undertaken with recognition that human activities and developments do not sit apart from the GBI network of SEE Park, but rather are a part of it’. It recommends the use of Natural England’s ANGSt standards and makes policy recommendations for the South Essex Joint Strategic Plan.	Some of these changes are reflected in the recommendations for the Reg18 Local Plan made in Chapter 6. Location-specific recommendations (ie those relating to growth areas) will be revisited at the next stage of work.

Appendix E

Stakeholder Workshop Outputs



Thurrock Green and Blue Infrastructure Strategy update

Welcome to the Stakeholder Workshop

Please introduce yourself and the organisation
you're representing in the chat function



The plan for today's workshop ...

PART 1

A few words from
Thurrock Council

Introduction to GBI and
the study (LUC)

PART 2

Open discussion on four
topics:

1. What are the priority objectives for the strategy?
2. How can we build on existing ideas for strategic proposal?
3. Ideas for new strategic proposals?
4. How to achieve maintenance of GBI and long-term stewardship?

PART 3

Finishing up and next
steps

Housekeeping

Please **mute your mic** when not speaking.

Please **raise your hand** to speak. Remember to unmute when speaking.

Chat can be used to add comments, questions or other points. The LUC team will add to the boards as 'sticky notes'.

LUC will also capture the spoken discussion using **sticky notes**.

PDFs of Miro boards will be circulated after the workshop.

What do we mean by GBI?

The National Planning Policy Framework (NPPF) 2021 defines GBI as:

'A network of multi-functional green and blue spaces and other natural features, urban and rural, which is capable of delivering a wide range of environmental, economic, health and wellbeing benefits for nature, climate, local and wider communities and prosperity.'

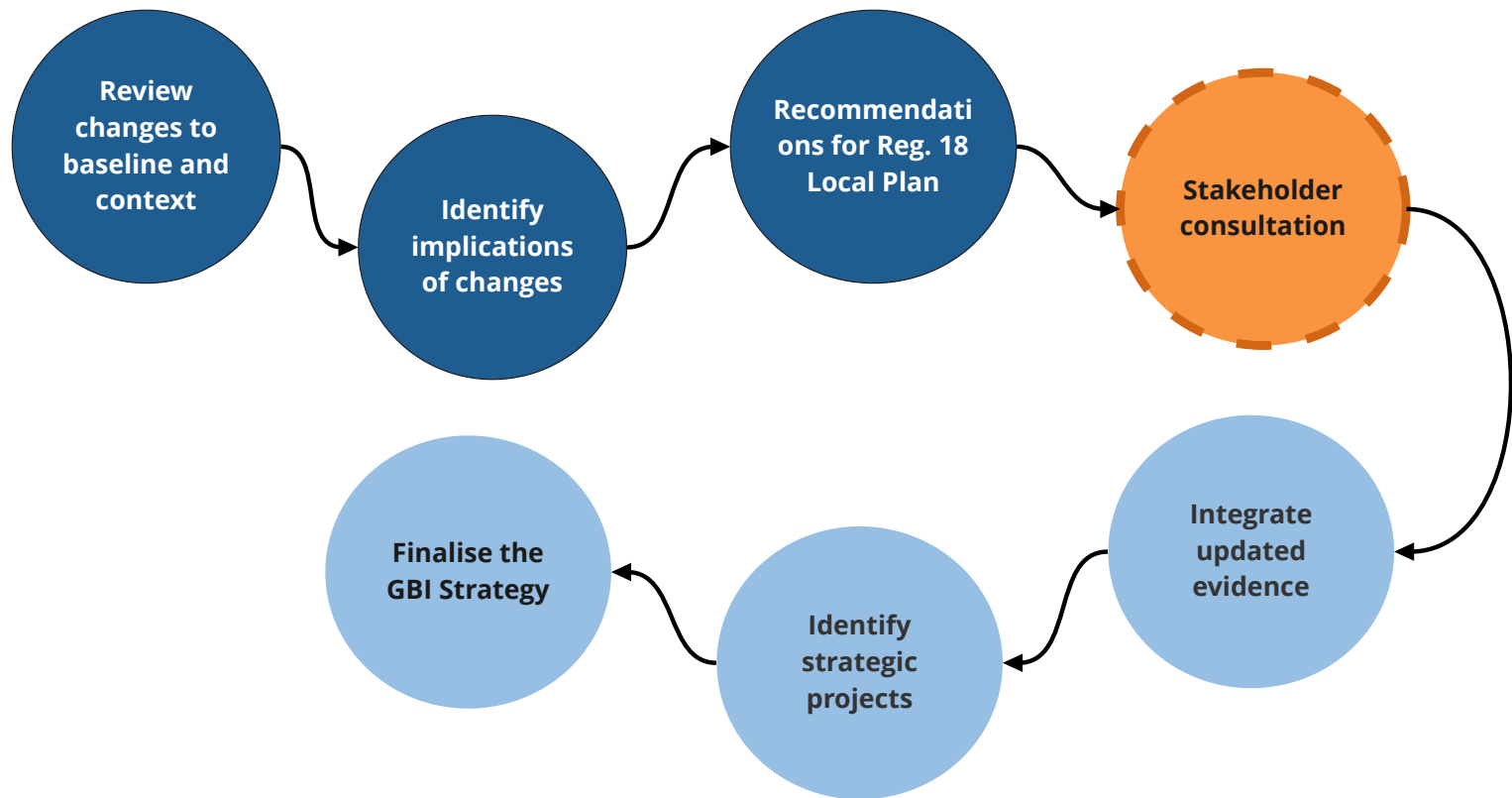


In a Nutshell: The aims of the study

- Setting out priorities for the provision of new and improved GBI.
- Supporting the development of the emerging Local Plan.
- Supporting the delivery of strategic GBI across Thurrock



Where are we in the development of the study?



Discussion Areas for today

1

Objectives and priorities

2

Review of 2018 strategic proposals

3

Prioritises for new strategic GBI projects

4

Identifying potential partnerships, funding and delivery mechanisms

Sit back... we will capture your key points using 'virtual stickies' ...

Heritage
assets

Strategic cycle
links/greenways

Wildlife and
pollinator
corridors

Priority objectives

Objective 1: Health and wellbeing: Help residents to live healthy lives by improving air quality, enabling easy access to high-quality recreational opportunities in green spaces and improving the living environment of Thurrock.

Objective 2: Climate change mitigation: Reduce Thurrock's carbon emissions by creating an extensive network of attractive routes for walking and cycling, to promote a modal shift away from motorised transport and promote land uses that increase carbon storage

Objective 3: Climate change adaptation and flooding: Prepare Thurrock for the current and future impacts of climate change by using green and blue infrastructure to build resilience to rising temperatures (e.g. shading in urban areas), increased flood risk and shifting habitat and species ranges

Objective 5: Biodiversity: Maintain and enhance Thurrock's biodiversity and maximise opportunities for people to connect with nature

Objective 4: Landscape, historic environment and sense of place: Maintain, enhance and restore landscapes and townscape making attractive places to live, enhancing settings of historic assets and positively managing potential adverse effects from new infrastructure

Objective 6: Green Belt: Promote positive use of Thurrock's Green Belt by improving its multifunctionality and increasing opportunities for outdoor recreation and access to nature, especially where development occurs in or near Green Belt

Are there any objectives which should be particularly emphasised in the Thurrock context?

Need to reference economic aspect - potentially to be added to health and wellbeing objective or landscape and sense of place objective

Funding and management aspect is missing - financial sustainability of the green grid should be considered

Carbon storage opportunities can sometimes be at odds with biodiversity

Stewardship and maintenance for any GBI asset that could come forward through the strategy must be considered

Weave in wider partnerships - e.g. Community Forest, Woodland Trust, Sustrans, Essex Local Nature Partnership etc.

Link with existing regional strategies and LNRS work for Essex

Resilient and responsive GBI projects should be highlighted e.g. with the LTC

Cross boundary GBI projects - Local nature partnership schemes to be included - to be clear over a hierarchy of objectives

Thurrock is relatively small geographically - multifunctionality is key and should be highlighted potentially through a multi-purpose objective to illustrate how projects can serve multiple functions

Connecting people with nature is mentioned in three objectives - there is a need for it's own objective (access to nature)

Term Nature based solutions should be used throughout the objectives

inclusive spaces is key - inclusive hard working spaces

Wording to be more proactive within the objectives - potentially draw out a top three objectives?

Objective 1 should incorporate inclusivity and access

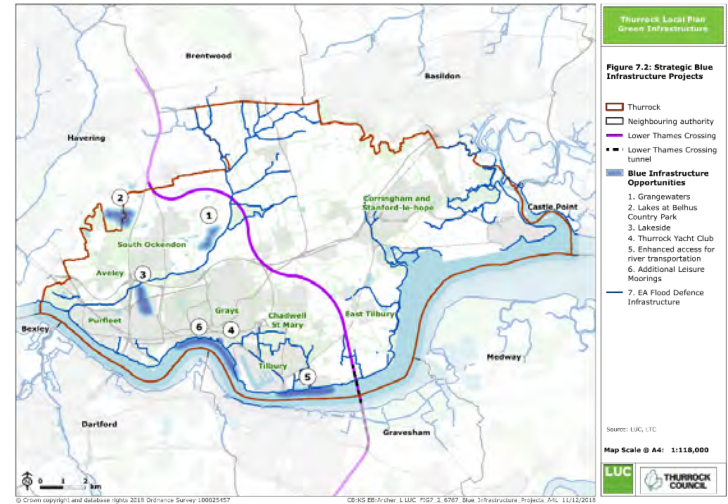
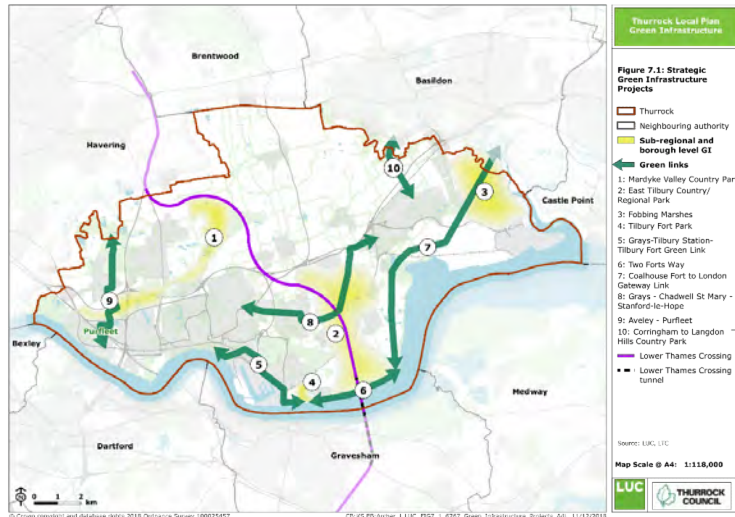
Objectives should try and overlap more and be better integrated - for example Objective 5 is more of a thread throughout the strategy

As three of the objective mention recreation, should it be it's own objective?

Objective 5: suggest rephrasing to include reference to maximising connections from nature to nature (include nature recovery) - should be 'nature first'

Objective 5: how we provide connectivity should be focused on more and how we can better protect biodiversity

Discussion 2: Review of existing strategic proposals



Mardyke Way is flooded or muddy a few months of the year - are there plans to improve that area? Needs to be included within proposals

Oliver Road Lagoons is hugely important and should be included - at the moment it is very isolated but any efforts to improve green connections should be taken. It is arguably the best invertebrate site in Thurrock.

Fobbing Marsh is undergoing major restoration project over the next few weeks - could do with help restoring the footpath on site - Natural England path also runs along that boundary

Improvements to access links is key - hoping to get additional funding from LTC to do this - Mardyke Way is a key part of this and how it connects to new routes (new cycle routes being provided by Highways)

Review all projects that have gone on over the last few years via the Thames Chase Community Forest Plan - should review landowners, partners, projects to then connect up

Design route for cycling - how can the Council ensure new routes and maintenance is implemented?

Forestry England - has a project at Mardyke Woods but aware of other proposals in the area (keen on green connectivity around number 9 and to connect up with other proposals within that area)

the protection, preservation and enhancement of existing green routes should be a strategic project. Also a lot of PROWs are being destroyed, and it would be useful to talk to Paula Watts, but there is a strategy to make those "almost 90% green routes" complete.

Links and PROW - Thurrock Rights of Way Improvements Plan is being created, looked at routes that could be multifunctional - potential for LUC to speak with them and access data

Omission - no east west link around 9) towards 1) Mardyke Country Park - LUC to add in

Main constraint is agreement with landowners

Should demonstrate synergy between GI and BI throughout report

Research is being done currently by Swansea & Glasgow Unis regarding blue infrastructure, biodiversity and retrofitting - speak with EA about the work

Southend is leading a resilience project (nature based solutions - could have a lot of cross over) - potential for knowledge sharing?

Major funding for flood risk mitigation - up stream funding and major flows - looked at Langdon Hills area and Mardyke Fen area (connect with Remsha)

Fenlands - a lot of flooding within the area (speak with Remsha - to see what she is working on and how we can integrate her work with our work)

Add in the Fenns as this floods, a strategic approach to reinstate ditches and swales would really help (speak to Remsha)

How can these proposals be extended, combined or refined further?

Support for east west link on the Estuary - EWT has site there and it lacks accessibility at the moment

Mardyke - South Essex Catchment Partnership (to speak with them regarding potential projects and connections with them)

retrofitting of SUDS within urban areas should be considered

Discussion 3: Priorities for new strategic GBI projects.

Opportunities for community food growing?

how can we do more informal food growing around education and link to areas around schools with the aim of getting kids more active and engaged?

all allotments in borough have waiting lists - Public Health Team is thinking of initiative called School Super Zones which could include local food growing

useful to have a mechanism (tool share?) within the Council for community gardens - include as a project within GBI strategy

Community gardens on housing sites might be coming forward - definite appetite within the Council to include

Potential project: Verges within settlements that could be used as community orchards or gardens or various habitats (Hackney has trialled this)

Thames Chase Community Forest - potential partner with regard to cross boundary projects (Avery Forest, Mardyke Valley, Fen restoration, pumping station etc.) and potential landscape restoration projects

This GBI strategy fits in with EWT objectives and long term vision - very supportive of all that has been said so far

an allotment has expanded to a community park and garden - there is an example of one within Thurrock (Rosedale Road & Bull Meadow Allotments Grays in Little Thurrock)

Opportunities for new cross-boundary projects e.g. complement and build on SEE Park concept / extend into Brentwood, Basildon and Havering ?

Thurrock is looking for routes to allow species migrations and habitat linkages and expansion as a LNRS with a focus on cross boundary projects

LUC to feed into LNRS process for Essex and vice versa (strategy will be prepared end of next year)

Opportunities around growth locations e.g. Green Belt enhancement ?

biodiversity should be considered also just for biodiversity and not just in the lens of multifunctionality

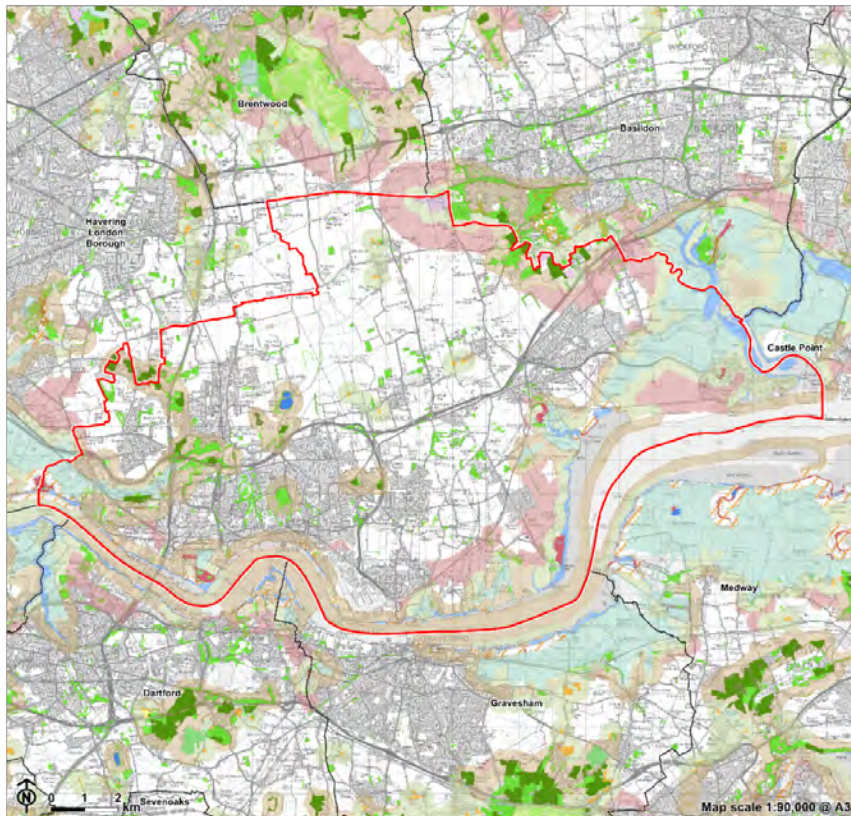
need to focus on SUDS and flood risk more going forwards within development sites and growth areas

Opportunities for wildlife and access corridors to connect between urban and rural areas?

Opportunities to protect / buffer SSSIs from recreational pressures

Opportunities for blue infrastructure e.g. developing a new Thames Foreshore proposal to include opportunities for leisure and transport

Habitat Networks

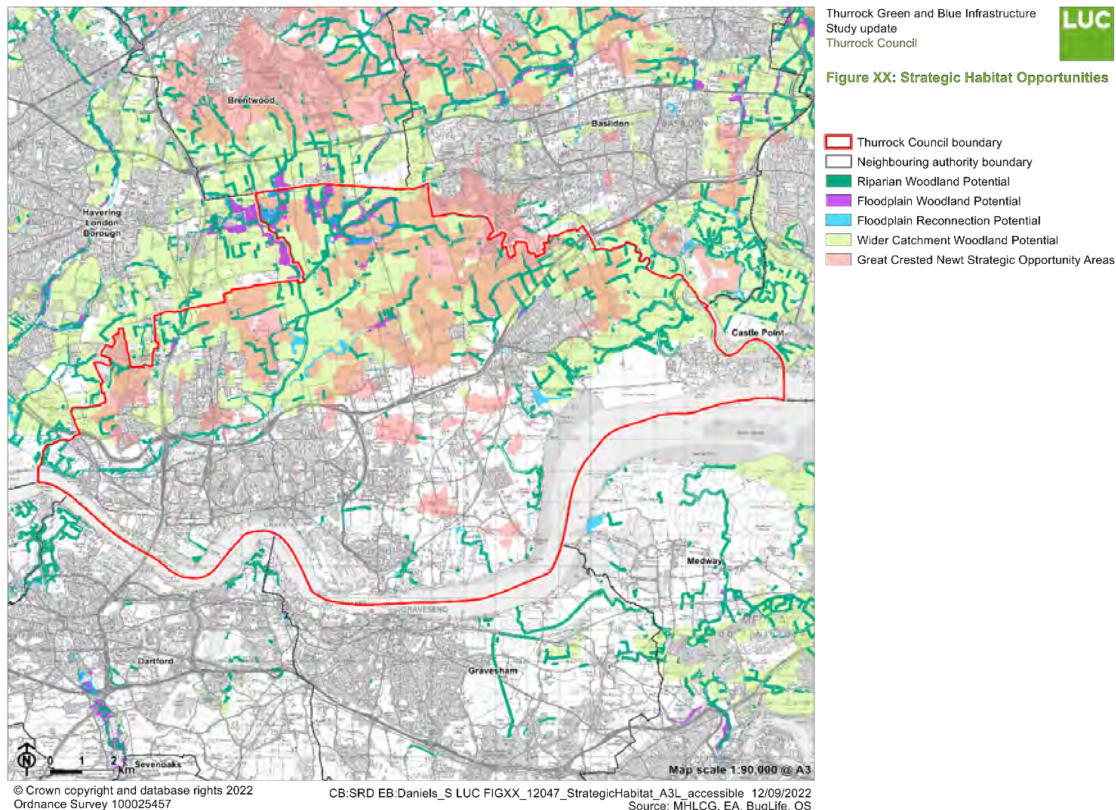


Thurrock Green and Blue Infrastructure
Study update
Thurrock Council

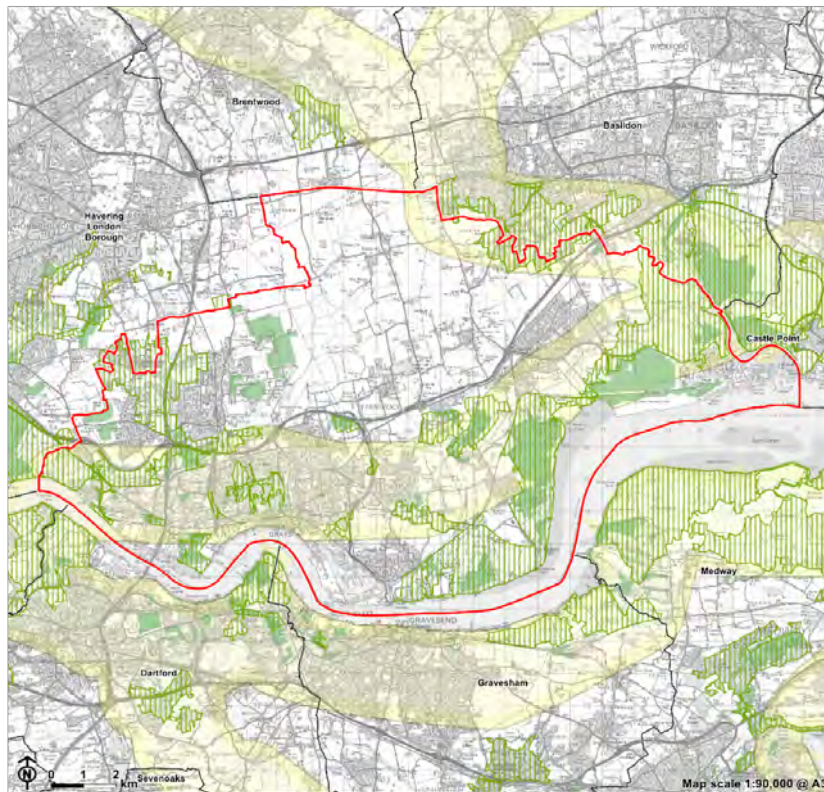


Figure XX: Habitat Network

Strategic habitat opportunities



Open Mosaic Habitat and Important Invertebrate Areas



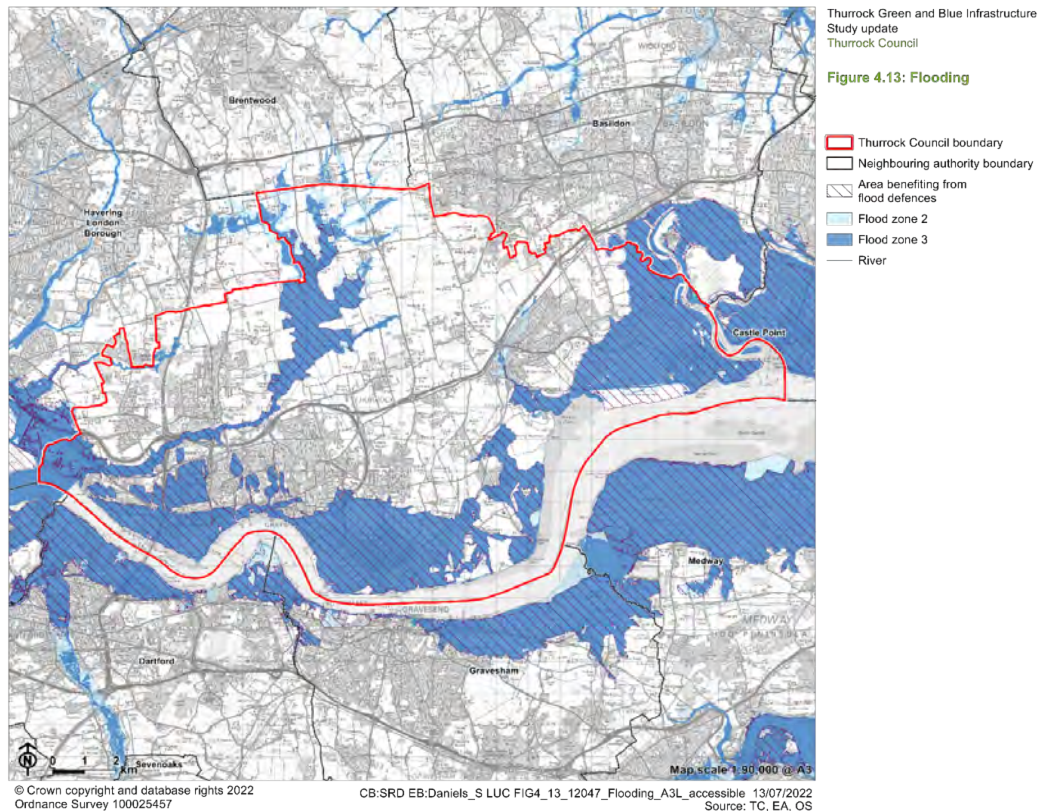
Thurrock Green and Blue Infrastructure
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Figure XX: Open Mosaic Habitat and Important Invertebrate Areas

- Thurrock Council boundary
- Neighbouring authority boundary
- Buglife - Thames Estuary IIA
- B-lines
- Open mosaic habitat

Flood risk



Cross-boundary GI

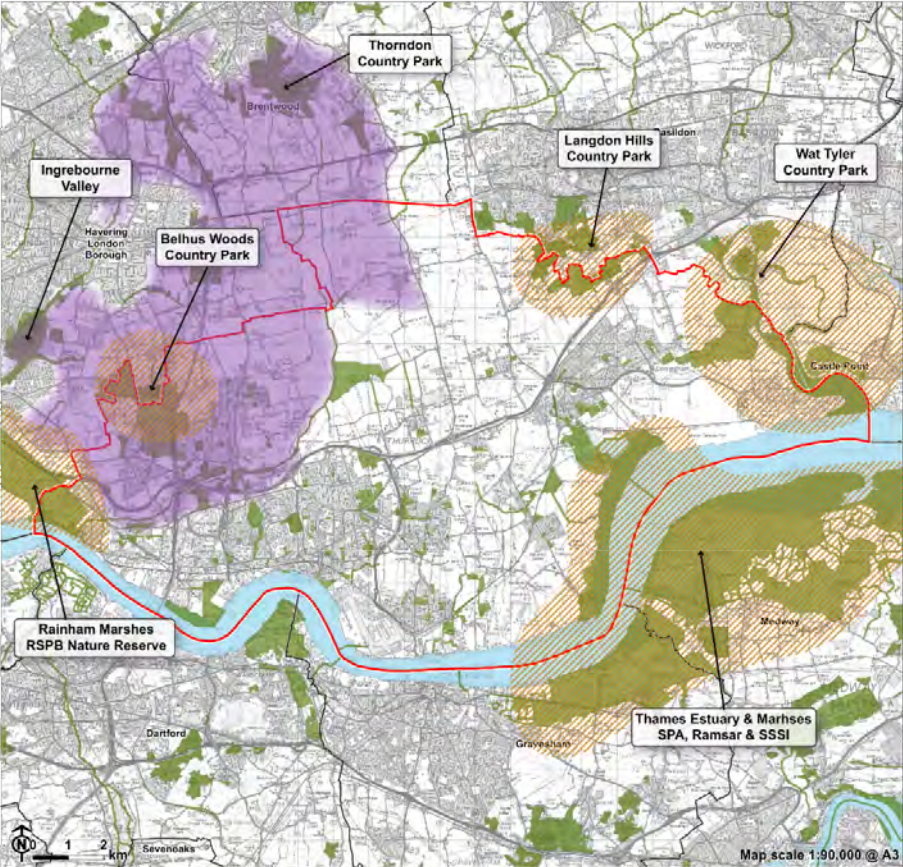
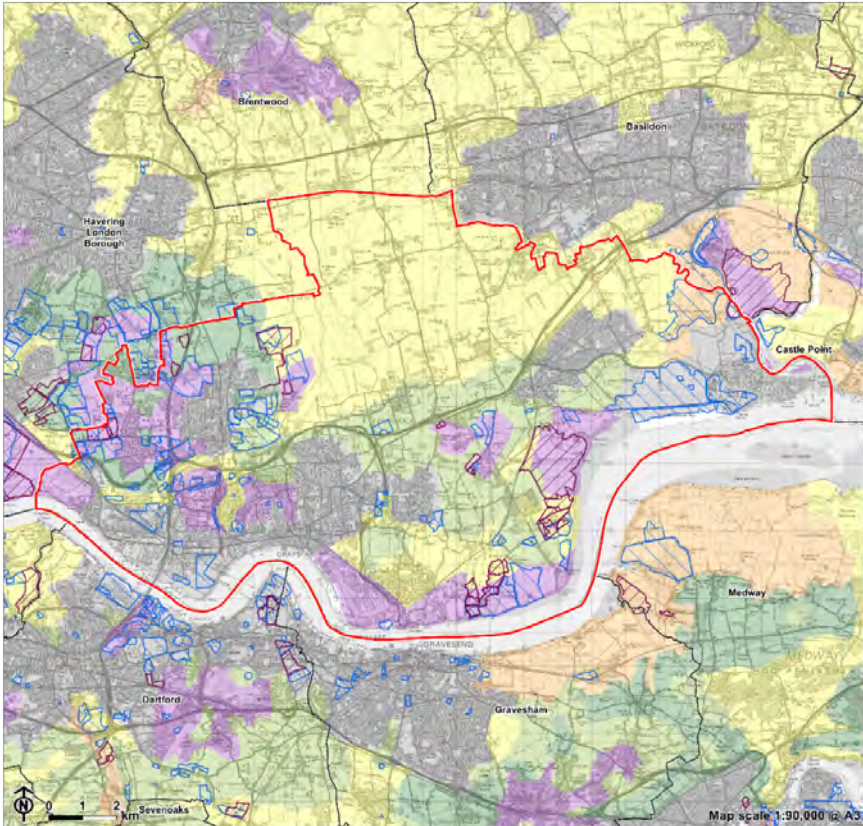


Figure 4.14: Cross Boundary Green Infrastructure

- Thurrock Council boundary
- Neighbouring authority boundary
- Green infrastructure*
- Cross boundary Green Infrastructure zone
- Thames Chase Community Forest

*Note: Some Green Infrastructure data holds indicative Data - Data from previous Thurrock project in 2016

Land availability



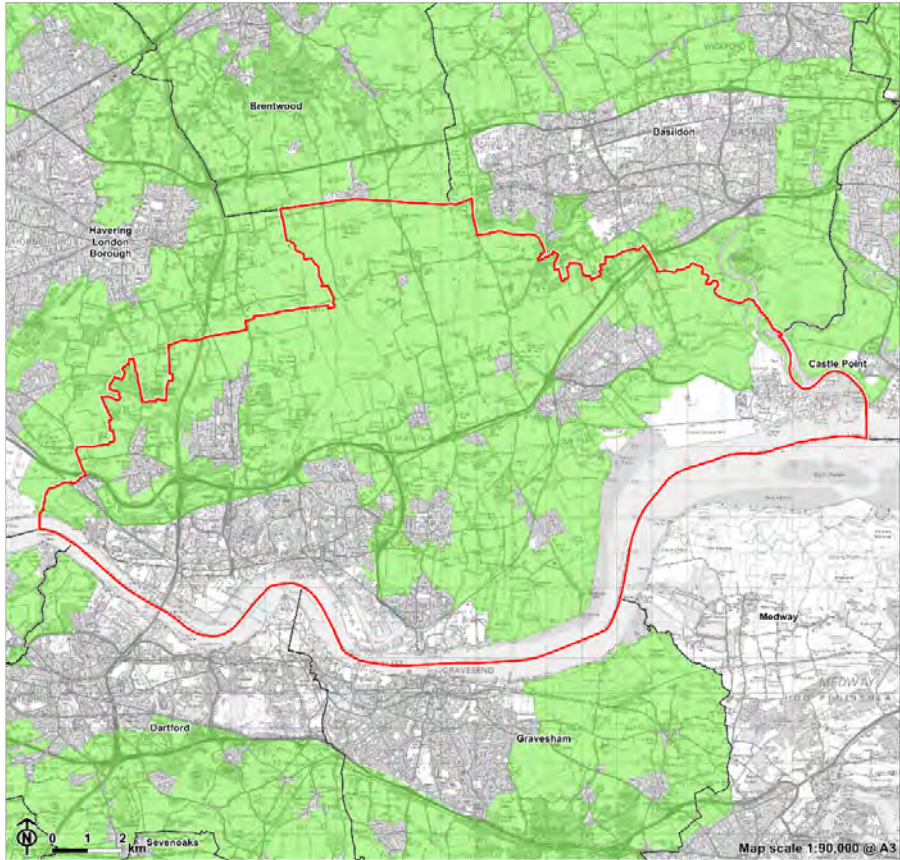
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Figure XX: Land availability

- Thurrock Council boundary
 - Neighbouring authority boundary
 - Historic landfill sites
 - Authorised landfill site
- Agricultural Land Classification pre 1988**
- Grade 1 (Excellent)
 - Grade 2 (Very good)
 - Grade 3 (Good to moderate)
 - Grade 4 (Poor)
 - Grade 5 (Very poor)
 - Non Agricultural
 - Urban

Green Belt



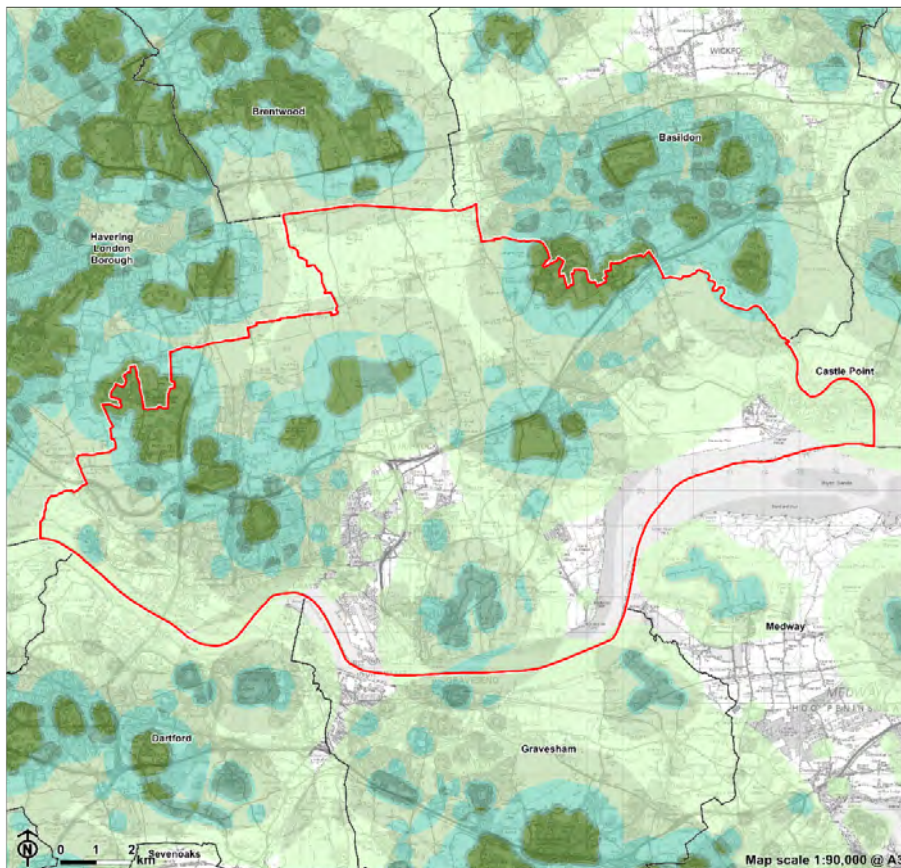
Thurrock Green and Blue Infrastructure
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Thurrock Council



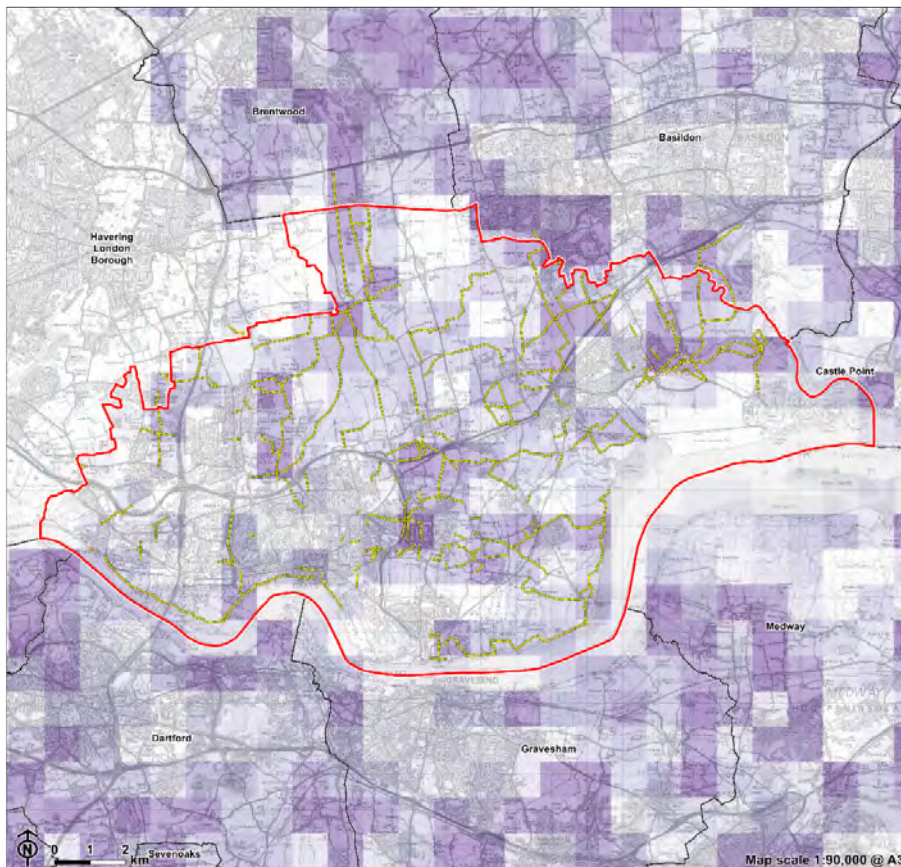
Figure 4.2: Green Belt

- Thurrock Council boundary
- Neighbouring authority boundary
- Green Belt

Accessible Natural Green Space



Public Right of Way



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Figure 4.10: Public Rights of Way

Discussion 4: Identifying potential partnerships, funding and delivery mechanisms



Partnerships

Corporate partnerships

Look beyond Thurrock boundaries and consider wider Essex and Thames Estuary as well as London Boroughs for partnerships, project ideas etc.

Thames Chase Community Forest - has funding for tree and hedgerow planting and landscape restoration projects

utilities companies specifically water companies both capture and treat surface water (Essex is looking at water strategy currently which could link with)

Neighbouring London Boroughs could be linked up with as they may be access and nature deprived

Local Nature Partnerships - local agricultural groups and biodiversity and planning groups and Local Nature Recovery Strategy

Thames Estuary 2100 Plan (undergoing 10 year review currently) - wider than flood risk and much more of a focus on sustainability and climate change - want to work together with Thurrock on the plan

SEE Park partnership and link should be picked up within strategy

Local Nature Partnership would be keen to be involved in strategy (their community engagement working group is already looking at local food growing)

Riverside Strategy Approach via EA - want councils to buy into this approach (working with a town in Grays - thinking about defences with nature and community in mind)



Funding

BNG good source of funding across Essex

ELMS could be an opportunity for funding

National Environment Readiness Fund - Essex has got funding to look at GI in affordable ways (outputs for September of next year)

Central government have town investment funds currently and they are looking at funding ecological projects

Development funding (CIL, developer contributions) - CIL is a good way to fund grassroots led projects (to look into how that can be maximised)

What are the potential mechanisms for long-term stewardship?

Milton Keynes Parks Trust as a potential example we can draw inspiration from?



Delivery Mechanisms

brownfield restoration projects in Havering have been done - has opened up a lot of green space within the borough - used endowments as part of funding (to look into this project as a potential initiative for Thurrock)

delivery and maintenance always underperforms - where have long term delivery methods worked? Groundwork Trust is a good example in Scotland

Viability is key

need proper business models to provide maintenance in long term - need to illustrate how Council's maintenance departments can be integrated with projects

What are the common issues regarding development and ongoing maintenance of GBI assets? What are potential the solutions?

Thank you for taking part today!



What's next?

1

Email thurrock.gbi@landuse.co.uk with any further comments

2

Continue to engage with us + Thurrock as key stakeholders and delivery partners.

Appendix F

Sources of funding for GBI

Public funding

F.1 Current public funding schemes and projects include:

- **Levelling Up funding**

- **UK Shared Prosperity Fund (UKSPF)** – each place will have flexibility to invest across a range of activities that represent the right solutions to improve local pride in place, increase life chances, to help spread and create opportunity, and a sense of community and belonging. Each place will be asked to develop a UKSPF plan. Interventions paid for under the ‘Communities and Place’ priority include “E3: Creation of and improvements to local green spaces, community gardens, watercourses and embankments, along with incorporating natural features into wider public spaces” and “E7: Support for active travel enhancements in the local area”.
- **Levelling Up Fund Round 3** - designed to invest in infrastructure that improves everyday life across the UK, including town centre and high street regeneration (including by bringing “accessible community spaces into town and city centres”), local transport projects (including active travel), and cultural and heritage assets (including “associated green spaces”). Whilst the government has not yet confirmed round 3 of the Levelling Up Fund, it is in discussion.

- **Environmental land management (ELM) funding**

- **Sustainable Farming Incentive (SFI)** - pays farmers to manage their land in an environmentally sustainable way (based on standards). Launching in June 2022, it aims to encourage actions that improve soil health (on arable, horticulture and grassland); recognise how moorland provides benefits to the public (public goods); and improve animal

health and welfare by helping farmers with the costs of veterinary advice for livestock. An SFI standards agreement will last for 3 years. Further info.

- **Local Nature Recovery (LNR)** - pays for actions that support local nature recovery and meet local environmental priorities; encourages collaboration between farmers. The scheme will begin piloting in 2022 and launch in 2024.
- **Landscape Recovery (LR)** - supports landscape and ecosystem recovery through long-term projects e.g. rewilding, large scale tree planting. Begins piloting in 2022, launches in 2024.
- **Other government grant funding:**
 - **England Woodland Creation Offer** – provides grant funding for a range of woodland creation, with higher payments for woodlands providing public goods, and a single application process for planting and maintenance payments. After 2024, EWCO will be rolled into the Government’s ELM schemes which will become the “main delivery mechanism” for publicly funded woodland creation and management.
 - **Highways agency designated funds** – includes a fund dedicated to environment and wellbeing with a range of themes (funds are for ‘enhancement’ and are separate to funds for mitigation e.g. for the LTC).
 - **Farming in Protected Landscapes programme** - funds projects that provide various public goods, including reduced flood risk
 - **Flood Defence Grant in Aid (FDGiA)** - funding provided by Defra to EA to manage flood risk, can be used for natural flood risk management (NFM) projects (though only a minority of projects funded are thought to be NFM projects)
 - **Health and wellbeing board funding** e.g. linked to social prescribing (HWBs bring together the NHS, public health, adult social care and children's services, including elected representatives and Local Healthwatch, to plan how best to meet the needs of their local population and tackle local inequalities in health).

- **Countryside Stewardship scheme** – Higher tier is now closed and Mid tier closing soon, but Applications for Capital Grants are still open and can be combined with SFI. Capital Grants offer standalone capital items within three groups: Boundaries, Trees and Orchards, Water Quality and Air Quality.
- **Countryside Stewardship Protection and Infrastructure grants** - open all year from 8 February 2022. This is a new standalone capital grant. The Countryside Stewardship Protection and Infrastructure agreement is made up of a two year capital grant under which you can apply for support to create FY2 (Woodland Infrastructure).
- **Woodland Management Plan grant** – Capital grant for farmers and land managers to produce a woodland management plan
- **Woodland Tree Health grant** – Capital grant for farmers and land managers to restock or improve woodland after tree health problems
- **Implementation Plan (PA1) and Feasibility Study (PA2) grants** – applications for an Implementation Plan or Feasibility Study grant available all year. Implementation Plan and Feasibility Study grants provide funding for more complex agreements and projects.

Private funding

- **Mandatory compensation/mitigation schemes**
 - **Biodiversity Net Gain** - mandatory requirement for development from late 2023
 - **Recreational disturbance avoidance and mitigation** - applies in areas where recreational impacts are undermining the condition of internationally important protected sites
 - **National Grid's Community Grant Programme** - funds projects with direct social and environmental benefits in communities affected by National Grid operations, notably the NSIP East Anglia GREEN.
- **Voluntary compensation**

- **Woodland Carbon Code** - the quality assurance standard for woodland creation projects in the UK; generates independently verified carbon units. Supported by robust science from Forest Research, independent validation and verification and a transparent registry where you can track ownership, transfer and use of credits.
- **Other private funding sources**
 - **National Lottery Heritage Fund** - including funding for projects that improve habitats or conserve species, as well as helping people to connect to nature in their daily lives
 - **Climate Action Fund** – Delivered by the National Lottery Community Fund, they're looking for projects that focus on the link between nature and climate. They want to fund projects that use nature to encourage more community-led climate action. Grants available up to £1.5 million over 2 to 5 years, with most projects between £300,000 and £500,000. Development grants of £50,000 to £150,000 over 12 to 18 months
 - **Woodland Trust funding for tree planting and hedge planting**
 - **Evergreen Fund** – invests in commercially viable environment projects and tree planting
 - **Landfill communities fund** - innovative tax credit scheme enabling operators of landfill sites in England and Northern Ireland to contribute money to organisations enrolled with ENTRUST as Environmental Bodies (EBs).
 - Mineral and waste site restoration funding
 - Water company funding of NFM, SUDS and catchment actions to improve water quality
 - Private sector/charity investment in improved visitor facilities, signage, routes etc

Alternative funding

F.2 Methods of funding green infrastructure also include alternative funding, which are particularly prevalent in areas where public funding is lacking and there is little incentive for private investment.

F.3 In 2021 a coalition of public and private partners (SWEEP) produced a report named Alternative Funding Mechanisms for Green Space. It is designed to assist individuals, organisations. and authorities in delivering and managing green spaces.

F.4 The categories of mechanisms set out in the report have been summarised in the diagram overleaf and are signposted throughout the Strategic Opportunity Profiles (SOAs) in order to suggest delivery mechanisms that may be appropriate for each SOA in turn.

F.5 For more information on the various funding mechanisms, the application of mechanisms, and successful case studies, the full report provides further details and can be accessed via the following link: <https://sweep.ac.uk/wp-content/uploads/AFM-Report.pdf>

F.6 An overview of alternative financing mechanisms for funding GBI (taken from 2021 SWEEP report):

■ **Income-generated opportunities and loans and taxation:**

- Sponsorship/naming rights
- Events of special uses
- Concessions
- Rental charges
- Bonds

■ **Alternative management structures:**

Appendix F Sources of funding for GBI

- Endowments
- Community asset transfers
- Non-profit distributing organisations (NDPOs)
- **Planning and development opportunities:**
 - Property assets/investment portfolios
 - Private sector
 - Land sales
 - Section 106 planning gain/CIL
- **Charitable giving and voluntary sector involvement:**
 - Subscription schemes
 - Investment crowd-funding
 - Donations/philanthropic partnerships
 - Community/volunteer groups
 - Corporate volunteering
- **Ecosystem development/payment for ecosystem services:**
 - Renewable energy tariffs
 - Utility and rights-of-way leasing
 - Offsetting
 - Water management
- **Multi-agency opportunities:**
 - Grant funding
 - Innovative use of public budgets
 - Shared-use agreements

F.7 Other notable funding sources in development:

Appendix F Sources of funding for GBI

- Big Nature Impact Fund – a new public-private blended finance vehicle being established by Defra with up to £30M public investment. It aims to drive investment in nature-based solutions at scale.
- Hedgerow carbon code (scheme being developed by Game & Wildlife Conservation Trust)
- New investment mechanisms being tested through the Natural Environment Investment Readiness Fund (this aims to develop projects that protect and enhance nature while also demonstrating innovative approaches to generating revenues from the wide range of benefits that nature provides)

References

- 1 MHCLG (2021) National Planning Policy Framework, <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
- 2 Natural England (2023) Green Infrastructure Principles, <https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Principles/GIPrinciples.aspx>
- 3 Joseph Rowntree Foundation (2014) Climate Change and Social Justice: An Evidence Review.
- 4 IPCC (2019) IPCC Special Report Global Warming of 1.5oC (online) Available at: <https://www.ipcc.ch/sr15/>
- 5 Tyndall Centre (2022) Setting Climate Commitments for Thurrock: Quantifying the implications of the United Nations Paris Agreement for Thurrock, <https://carbonbudget.manchester.ac.uk/reports/E06000034/>
- 6 Department for Business, Energy & Industrial Strategy (2021) UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2019. [online] Available at: <https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2019>
- 7 Ibid.
- 8 Ibid.
- 9 ONS (2011) Census Data: Method of travel to work (2001 specification) , local authorities in England and Wales
- 10 NOMIS (2011) WP7701EW - Method of travel to work (2001 specification) by distance travelled to work (Workplace population) [online] Available at: http://www.nomisweb.co.uk/census/2011/WP7701EW/view/1946157204?rows=transport_powpew11&cols=aggdtpew11_powpew11, Accessed: 11/04/2018
- 11 Aecom (2018) Thurrock Borough Council Level 1 Strategic Flood Risk Assessment

References

- 12 Thurrock Council (2010) The Local Climate Impacts Profile (NI 188): Planning for Thurrock's Adaptation to Impacts of Climate Change
- 13 Environment Agency (2010) TE2100 Plan
- 14 Environment Agency (2015) Thames River Basin Management Plan, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718342/Thames_RBD_Part_1_river_basin_management_plan.pdf
- 15 South Essex Catchment Partnership (2020) South Essex Catchment Plan, <https://storymaps.arcgis.com/collections/a8d4bc8ee3da4d2f980553751680151c>
- 16 Community Forests Northwest (2011) Green Infrastructure to Combat Climate Change. A Framework for Action in Cheshire, Cumbria, Greater Manchester, Lancashire and Merseyside.
- 17 Forestry Research (2010). Benefits of Green Infrastructure. Available at: [https://www.forestry.gov.uk/pdf/urgp_benefits_of_green_infrastructure.pdf/\\$FILE/urgp_benefits_of_green_infrastructure](https://www.forestry.gov.uk/pdf/urgp_benefits_of_green_infrastructure.pdf/$FILE/urgp_benefits_of_green_infrastructure)
- 18 J. Lawton for Defra (2010) Making Space for Nature: a review of England's wildlife sites and ecological network, <https://webarchive.nationalarchives.gov.uk/20130402170324/http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf>
- 19 Natural England (2022) Destinations programme, Sites of Special Scientific Interest, <https://www.gov.uk/government/publications/natural-england-designations-programme-for-areas-sites-and-trails/natural-englands-designations-programme>
- 20 Forestry Research (2010). Benefits of Green Infrastructure. Available at: [https://www.forestry.gov.uk/pdf/urgp_benefits_of_green_infrastructure.pdf/\\$FILE/urgp_benefits_of_green_infrastructure.pdf](https://www.forestry.gov.uk/pdf/urgp_benefits_of_green_infrastructure.pdf/$FILE/urgp_benefits_of_green_infrastructure.pdf)
- 21 Department of Levelling Up, Housing and Communities (2019) Index of Multiple Deprivation mapping tool (online) Available at: https://dclgapps.communities.gov.uk/imd/iod_index.html

References

- 22** Essex Live (2019). Revealed: The top 10 worst areas in Essex for child poverty, [online]. Available at: <https://www.essexlive.news/news/essex-news/revealed-top-10-worst-areas-3518643>. [Accessed May 2022].
- 23** Public Health England (2019), Health Profiles (Thurrock), [online] available at: <https://fingertips.phe.org.uk/static-reports/health-profiles/2019/e06000034.html?area-name=thurrock>
- 24** Ibid.
- 25** Thurrock Council (2018) Population breakdown, mental health and Universal Credits, March 2018, <https://www.thurrock.gov.uk/sites/default/files/assets/documents/statistics-employment-health-201803-v01.pdf>
- 26** Department for Transport (2021) Journey time statistics, <https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts#journey-times-to-key-services-by-local-authority-jts04>
- 27** The Echo. (2021). Dozens of schools in Thurrock are in areas of 'dangerous pollution' [online]. Available at: <https://www.echo-news.co.uk/news/19085441.dozens-schools-thurrock-dangerous-areas-pollution/>. [Accessed May 2022].
- 28** <https://www.thurrock.gov.uk/air-quality/air-quality-management-areas>
- 29** Forest Research (2010). Benefits of green infrastructure. Report by Forest Research
- 30** ONS (2022) Population and household estimates, England and Wales: Census 2021 (online) Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationandhouseholdestimatesenglandandwalescensus2021>
- 31** ONS (2019) Estimated number of households by selected household types, local authorities in England and Wales, counties and regions of England, Scottish council areas, and Great Britain constituent countries, 2004 to 2019 [online] Available at:

References

- <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/families/adhocs/13586estimatednumberofhouseholdsbyselectedhouseholdtypeslocalauthoritiesinenglandandwalescountiesandregionsofenglandscottishcouncilareasandgreatbritainconstituentcountries2004to2019>
- 32** ONS (2020). Population projections – local authorities: SNPP Z1 [ONLINE] Available At: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/localauthoritiesinenglandz1>
- 33** ONS (2022) Population and household estimates, England and Wales: Census 2021 (online) Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationandhouseholdestimatesenglandandwalescensus2021>
- 34** Thurrock Economic Growth Strategy (2016) Available online: <https://www.thurrock.gov.uk/sites/default/files/assets/documents/strategy-economic-growth-2016-v01.pdf>
- 35** Thurrock Council (no date). Planning and growth. Available online: <https://www.thurrock.gov.uk/growth>
- 36** Forestry Research (2010). Benefits of Green Infrastructure. Available at: [https://www.forestry.gov.uk/pdf/urgp_benefits_of_green_infrastructure.pdf/\\$FILE/urgp_benefits_of_green_infrastructure.pdf](https://www.forestry.gov.uk/pdf/urgp_benefits_of_green_infrastructure.pdf/$FILE/urgp_benefits_of_green_infrastructure.pdf)
- 37** Planning Inspectorate (2022) Lower Thames Crossing, Development Consent Order application, <https://infrastructure.planninginspectorate.gov.uk/projects/south-east/lower-thames-crossing>
- 38** National Highways (2020) Designated Funds Plan, <https://nationalhighways.co.uk/media/lh2ll0ao/designated-funds-plan-2020-2025.pdf>
- 39** National Grid (2022) East Anglia Green Energy Enablement (GREEN) [online] Available at: <https://www.nationalgrid.com/electricity-transmission/document/142446/download>

References

- 40** National Grid (2022) GREEN: Core and Preliminary Routeing and Siting Study Report [online] Available at: <https://www.nationalgrid.com/electricity-transmission/document/142461/download>
- 41** National Grid (2022) East Anglia Energy Enablement (GREEN): Project Background Document [online] Available at: <https://www.nationalgrid.com/electricity-transmission/document/142446/download>
- 42** National Grid (2022) Interactive map [online] Available at: <https://eastangliagreen.participatr.io/index.php?contentid=27>
- 43** British Geological Survey (2002) Essex Mineral Resources, <https://www2.bgs.ac.uk/mineralsuk/download/england/essexMap.pdf>
- 44** LUC (2018) Thurrock Landscape Character Assessment
- 45** LUC (2018) Thurrock Landscape Sensitivity Evaluation
- 46** Development types as part of the Landscape Sensitivity Study include four different housing sizes of housing development (2.5-3000ha), flats, tall structures, major warehouse/industry, solar farms, commercial wind turbines, open storage, lorry parks, minerals and waste sites.
- 47** Natural England (2013) National Character Area Profile: 111: Northern Thames Basin [online], Available at: <http://publications.naturalengland.org.uk/publication/4721112340496384?category=587130>, Accessed:13/04/2018
- 48** Natural England (2013) National Character Area Profile: 81: Greater Thames Estuary [online], Available at: <http://publications.naturalengland.org.uk/publication/4531632073605120?category=587130>, Accessed: 13/04/2018
- 49** Stantec (2019) Thurrock Strategic Green Belt Assessment Stages 1a and 1b. [pdf]. Available from: <https://www.thurrock.gov.uk/sites/default/files/assets/documents/lptech-thurrock-greenbelt-201901-v01.pdf>
- 50** Historic England (2017) East of England Register 2017

References

- 51** Thurrock Council (2007)
- 52** Natural England (2021) Carbon storage and sequestration by habitat: a review of the evidence, <http://publications.naturalengland.org.uk/publication/5419124441481216>
- 53** Natural England (date unavailable) Designated Sites View, [online], available at: <https://designatedsites.naturalengland.org.uk/>, accessed: 25/4/18
- 54** Unfavourable declining: The unit/feature is not being conserved and will not reach favourable condition unless there are changes to site management or external pressures. The site condition is becoming progressively worse.
- Unfavourable no change: The unit/feature is not being conserved and will not reach favourable condition unless there are changes to the site management or external pressures and this is reflected in the results of monitoring over time, with the results not moving towards the desired state.
- Unfavourable recovering: Units/features are not yet fully conserved but all the necessary management mechanisms are in place.
- 55** Thurrock Council (2006) Thurrock Biodiversity Study 2006-2011, <https://www.thurrock.gov.uk/sites/default/files/assets/documents/eb.010.pdf>
- 56** Natural England (2021) Essex Natural Capital Atlas (NC Atlas 13, edition 2): mapping indicators, <http://publications.naturalengland.org.uk/file/5018534399967232>
- 57** Natural England (2023) National Character Area 111 – Northern Thames Basin: Analysis, <https://nationalcharacterareas.co.uk/northern-thames-basin/analysis/>
- 58** Natural England (2023) National Character Area 81 – Greater Thames Estuary: Analysis, <https://nationalcharacterareas.co.uk/greater-thames-estuary/analysis/>

References

- 59** Bird Aware Essex Coast (2020) Essex Coast Recreational disturbance Avoidance and Mitigation Strategy Supplementary Planning Document (SPD), May 2020, <https://birdaware.org/essex/wp-content/uploads/sites/3/2021/11/Essex-coast-RAMS-SPD-2020.pdf>
- 60** Thurrock Open Space Assessment (2017) by Knight, Kavanagh & Page (KKP)
- 61** Thurrock Open Space Standards Paper (2016)
- 62** Natural England (2022) Green Infrastructure mapping, <https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Map.aspx>
- 63** Based on data from Thurrock Open Space Study (2017)
- 64** Thurrock Council Public Realm (2021) Public Land Maintenance Strategy [online] Available at: <https://democracy.thurrock.gov.uk/documents/s33376/Public%20Land%20Maintenance%20Strategy%20-%20Appendix%201.pdf>
- 65** Natural England (2020) England Coast Path: Tilbury to Southend-on-Sea, <https://www.gov.uk/government/collections/england-coast-path-tilbury-to-southend-on-sea>
- 66** Lower Thames Crossing (2022) Design for walkers, cyclists and horse riders, <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-001313-7.4%20Project%20Design%20Report%20Part%20E%20-%20Design%20for%20Walkers,%20Cyclists%20and%20Horse%20Riders.pdf>
- 67** Thurrock Council (2017) Improving the cycle network, <https://www.thurrock.gov.uk/sites/default/files/assets/documents/cycle-programme-details-201712-v02.pdf>
- 68** Thurrock Council (2021) Funding for new walking and cycling routes (consultation), <https://consult.thurrock.gov.uk/active-travel>

References

- 69** Thurrock Council (2017) Active Travel Strategy Survey report, <https://thurrock-consult.objective.co.uk/file/4778454>
- 70** DataShine Commute Tool visualises work flows based on the 2011 census
<http://commute.datashine.org.uk/#mode=allflows&direction=both&msoa=undefined&zoom=12&lon=-0.1500&lat=51.5200>.
- 71** Environment Agency (2022) Catchment Data Explorer, Thames River Basin District, <https://environment.data.gov.uk/catchment-planning/RiverBasinDistrict/6>
- 72** AECOM (2018) Thurrock Borough Council Level 1 Strategic Flood Risk Assessment
- 73** AECOM (2018) Thurrock Borough Council Level 1 Strategic Flood Risk Assessment
- 74** AECOM (2018) Thurrock Borough Council Level 1 Strategic Flood Risk Assessment
- 75** Environment Agency (2022) Flood map for planning [online] Available at: <https://flood-map-for-planning.service.gov.uk/>
- 76** ARUP (2020) Thurrock Climate Change Scoping Study (pdf) Available at: <https://democracy.thurrock.gov.uk/documents/s29309/Thurrock%20Climate%20Change%20Strategy%20-%20Appendix%201%20Thurrock%20Climate%20Change%20Scoping%20Study%20Report.pdf>
- 77** Environment Agency (2012) TE2100 Plan: Managing flood risk through London and the Thames Estuary
- 78** Environment Agency (2018) Thames river basin district river basin management plan, <https://www.gov.uk/government/publications/thames-river-basin-district-river-basin-management-plan>
- 79** Alexandra Steed Urban (2020) South Essex Strategic Green and Blue Infrastructure Study, <https://ca1-jsp.edcdn.com/downloads/South-Essex-Strategic-Green-and-Blue-Infrastructure-Study.pdf>

References

- 80** Natural England (2023) Green Infrastructure Framework: process journey for local planning authorities,
<https://designatedsites.naturalengland.org.uk/GreenInfrastructure/downloads/Process%20Journey%20for%20Local%20Planning%20Authorities.pdf>
- 81** <https://www.estuaryedges.co.uk/>
- 82** LUC (2022) Mardyke Enhancement Scheme, unpublished report
- 83** Natural England (2023) Introduction to the Green Infrastructure Framework – principles and standards for England,
<https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Home.aspx>
- 84** Natural England (2023) Green Infrastructure Principles,
<https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Principles/GIPrinciples.aspx>
- 85** Hislop, M., Scott, A.J. and Corbett, A. (2019) What Does Good Green Infrastructure Policy Look Like? Developing and Testing a Policy Assessment Tool Within Central Scotland UK, *Planning Theory & Practice*, 20:5, 633-655.
- 86** Forest Research (2021) UK urban canopy cover map,
<https://www.forestresearch.gov.uk/research/i-tree-eco/uk-urban-canopy-cover/>
- 87** MHCLG (2019) National design guide,
<https://www.gov.uk/government/publications/national-design-guide>
- 88** Natural England (2023) Green Infrastructure Framework: Green Infrastructure Planning and Design Guide,
<https://designatedsites.naturalengland.org.uk/GreenInfrastructure/DesignGuide.aspx>
- 89** Natural England (2023) Urban Green Factor for England User Guide,
<https://designatedsites.naturalengland.org.uk/GreenInfrastructure/downloads/Urban%20Greening%20Factor%20for%20England%20User%20Guide.pdf>

References

- 90 Natural Capital Committee. (2015) Third State of Natural Capital Report.
- 91 <https://www.buildingwithnature.org.uk/>
- 92 A Green Future: Our 25 Year Plan to Improve the Environment UK Government, Jan 2018
- 93 Defra (2023) Environmental Improvement Plan 2023, <https://www.gov.uk/government/publications/environmental-improvement-plan>
- 94 The Community Infrastructure Levy is a planning charge, introduced by the Planning Act 2008 as a tool for local authorities in England and Wales to help deliver infrastructure to support the development of their area.” Planning Portal https://www.planningportal.co.uk/info/200126/applications/70/community_infrastructure_levy
- 95 Legislation.gov (2006) Natural Environment and Rural Communities Act 2006 [online] Available at: <https://www.legislation.gov.uk/ukpga/2006/16/section/40>
- 96 Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2019) National design guide [online] Available at: <https://www.gov.uk/government/publications/national-design-guide>
- 97 Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2021) National Model Design Code [online] Available at: <https://www.gov.uk/government/publications/national-model-design-code>
- 98 UK Parliament (2022) Levelling-up and Regeneration Bill [online] Available at: <https://bills.parliament.uk/bills/3155>
- 99 South Essex Joint Strategic Plan Statement of Common Ground, June 2018

References

- 100** Essex City Council (2020) Essex Green Infrastructure Strategy [online] Available at: <https://www.placeservices.co.uk/media/325343/essex-gi-strategy-accessible-pdf.pdf>
- 101** Active Essex (2021) Fit for the Future: The Physical Activity and Sport Strategy for Essex, Southend and Thurrock 2021-2031 [online] Available at: https://www.activeessex.org/wp-content/uploads/2021/06/Strategy_Online.pdf
- 102** Essex County Council (2018) Essex Joint Health and Wellbeing Strategy 2018-2022 [online] Available at: <https://data.essex.gov.uk/dataset/e6k09/essex-joint-health-and-wellbeing-strategy-2018-2022>
- 103** MHCLG (2017) Fixing Our Broken Housing Market
- 104** Transport East (2021). Active Travel Strategy: <https://storymaps.arcgis.com/stories/2a9dc81f27494cde86f636abde155a49>

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