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Thurrock Integrated Landscape Character Assessment

Part 1: Introductory Chapters and Appendices

Final Report
Prepared by LUC
October 2018



Project Title: Thurrock Integrated Landscape Character Assessment Part 1

Client: Thurrock Council

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2022 review

This report was reviewed in 2022 to check it still presents a robust analysis of Thurrock's landscape character.

While the National Planning Policy Framework (NPPF) has been updated since this report was completed, the principles set out in the report still apply (albeit they are now referenced in paragraph 174 of the NPPF rather than paragraph 170 and have slightly altered wording).

The 'Approach to Landscape Character Assessment' (published by Natural England in 2014), which informed the approach to this landscape character assessment, is still current guidance for Landscape Character Assessment. The method and approach used in this study is therefore still sound.

The GIS data upon which the landscape classification was based is still relevant. The OS maps are dated 2016 and there have been some changes on the ground since the completion of this report in 2018 as follows:

Employment development

- LCA C1 Belhus Farmed River Terrace Gravels: A new distribution centre at Ponds Farm, Purfleet (between the Jubilee Way Industrial Area and the A13 where its influence is relatively well contained).
- LCA F3 Mucking Marshes: a new office and storage building (now complete, but already visible in 2018).

- LCA G1 West Thurrock Marshes: New port infrastructure at Purfleet and a storage and distribution centre on the old Royal Mail East London distribution hub at Thurrock Euro Terminal (both in an already developed area).
- LCA G2 Tilbury Docks: Storage and distribution development at Tilbury Docks (in an already developed area)
- LCA G3 Tilbury: Additional warehouse, storage and distribution developments north of Tilbury at London Distribution Park (extending industrial development northwards, although the 2018 report already recognises the presence of London Distribution Park).
- LCA G4 London Gateway Port: Warehouse developments at London Gateway (NB London Gateway was under construction in 2018 although more plots have been developed since).

Residential development (over 100 units)

- LCA D1 Aveley: 114 dwellings on the former Aveley Football Ground and 340 dwellings at Aveley Village Extension (the latter being a green field extension in this already settled character area).
- LCA D2 South Ockendon: 185 dwellings at the former Ford Motor Company in South Ockendon (urban site).
- LCA E2 Grays, Chafford Hundred and South Stifford: 102 dwellings on the former Hillside Club at Grays, 362 dwellings on the former Thurrock Technical College in Grays (increasing the amount of housing in this already settled landscape character area).
- LCA G3 Tilbury: residential re-development of former St Chad's School creating 128 units (increasing the amount of housing in this already settled landscape character area).
- LCA H1 East & West Tilbury Open Undulating Farmland: 299 dwellings at Bata Field East Tilbury and 350 residential dwellings on land at St Clere's Golf Club, extending some residential development onto green field sites in this more rural character area.

Although these developments have changed the character of the land within their boundaries, they do not change the landscape classification which is largely based on underlying influences, or the key characteristics that define these areas. The classification, descriptions of key characteristics and advice for each area therefore remain relevant.



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Part 1: Overview



1 Introduction

Background & Purpose of the Landscape Character Assessment

- 1.1 Thurrock Council commissioned LUC in August 2015 to review and update the existing landscape character evidence base, and produce a comprehensive assessment of landscape character. It is intended to provide context for policies and proposals within the emerging Local Plan, inform the determination of planning applications, and inform the management of future change through regeneration and strategic partnerships for the delivery of green infrastructure, with the ultimate goal of achieving good design and making Thurrock better for people.
- 1.2 This character assessment updates the Borough's previous Landscape Character Assessment¹ and incorporates information from subsequent urban and landscape character studies² to provide a comprehensive and up to date landscape character assessment for the whole of the Borough, including urban areas, rural areas and the river. The term 'landscape' within this study refers to both the countryside and urban areas (sometimes also referred to as 'townscape') and also includes the open water of the River Thames.
- 1.3 The need for a strong and clear landscape evidence base is vital in the context of the considerable development pressures Thurrock faces; primarily the need to increase the rate of housing delivery, as well as the Lower Thames crossing. Thurrock lies within the Thames Gateway South Essex (TGSE), a national priority area for social and economic development, and large numbers of housing, jobs and associated infrastructure are being created in the area.
- 1.4 Understanding the character of place and evaluating an area's defining characteristics is a key component in managing growth sustainably and ensuring that the inherent quality of Thurrock's natural and built environments continue to be celebrated, creating places that people can be proud of.

Structure of this report

- 1.5 This report (Part I) is set out in two parts. Part 1 provides an overview, comprising:
 - **Section 1** which presents an introduction, background and policy context.
 - **Section 2** which presents the methodology and approach to the landscape character assessment.
 - **Section 3** which presents the physical and cultural evolution of the Thurrock landscape.
 - **Section 4** which presents forces for change acting on the landscape and ways to minimise harm to landscape character.
- 1.6 **Part 2** presents the landscape character of Thurrock comprising:
 - **Section 5** which presents the landscape classifications at the strategic and local scales.
 - **Section 6** which presents the landscape character of Thurrock in detail (this is presented in a separate report, Part II, due to its file size).
- 1.7 The report is supported by the following appendices:
 - **Appendix 1** provides a glossary of terms.

¹ Thurrock Landscape Capacity Study, 2005, CBA for Thurrock Council

² 'Recognising Sense of Place': Thurrock Urban Character Study, 2007, CBA for Thurrock Council; Thames Gateway Historic Environment Characterisation Project, 2004, CBA for Thurrock Council

- **Appendix 2** presents a 'User Guide' to help developers and decision makers make best use of the information in the assessment.
- **Appendix 3** presents the Bibliography and Reference list.

Policy Context

National Planning Policy Framework (NPPF), 2018

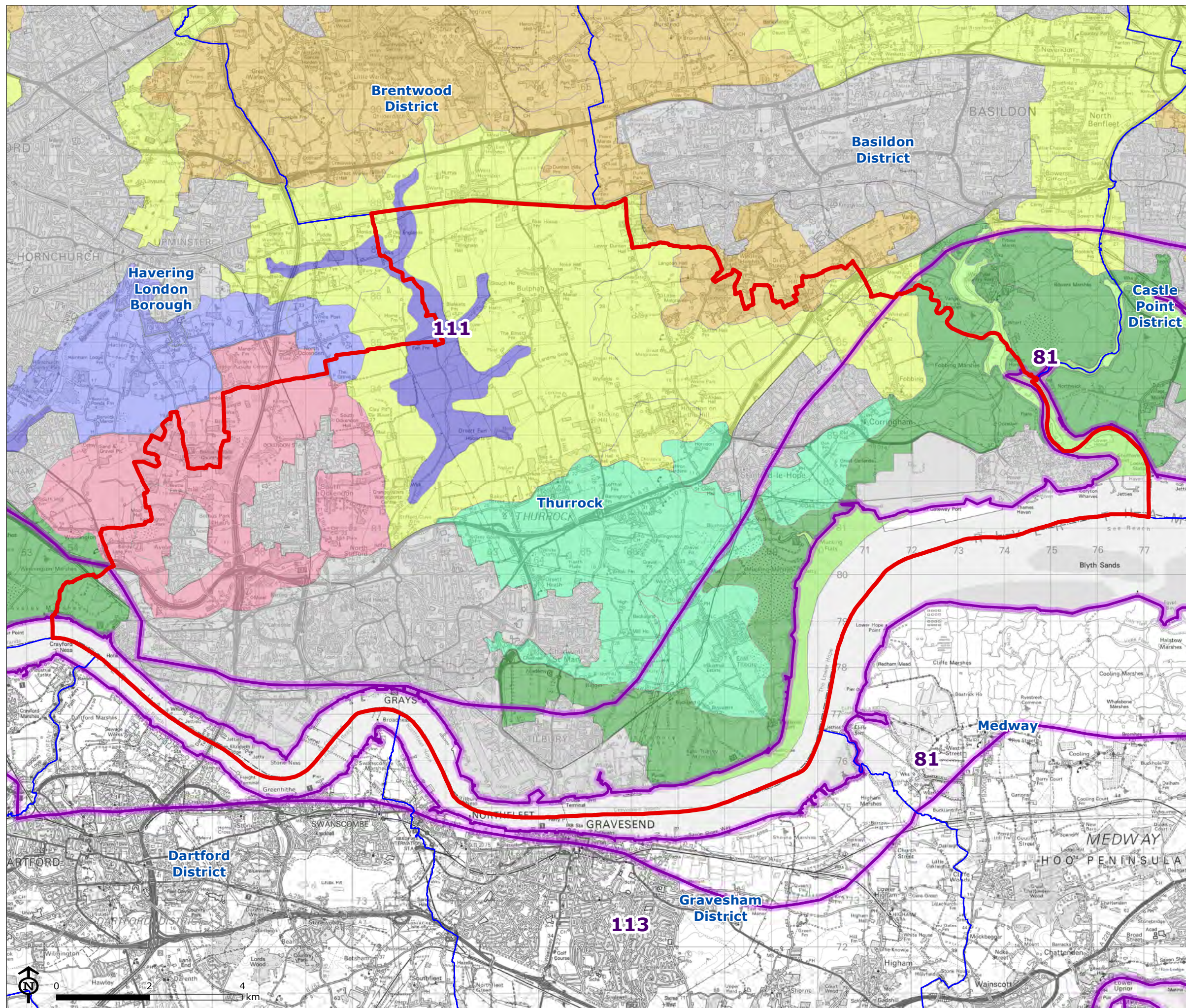
- 1.8 The revised National Planning Policy Framework NPPF, published in 2018, states as a core principle that planning should recognise 'the intrinsic character and beauty of the countryside...' (para 170.b)
- 1.9 The NPPF calls for valued landscapes to be protected and enhanced, stating "*Planning policies and decisions should contribute to and enhance the natural and local environment by... protecting and enhancing valued landscapes, sites of geological value and soils (in a manner commensurate with their statutory status or identified quality)*" (para 170.a).
- 1.10 An up-to-date Landscape Character Assessment is also recommended in the Planning Practice Guidance (PPG) to support planning decisions by local planning authorities.

Relationship to Published Landscape Character Assessments

- 1.11 Landscape does not stop at administrative boundaries but continues seamlessly into surrounding Boroughs. Therefore, an aim of this assessment was to join up with the Landscape Character
- 1.12 Assessments of adjacent authorities, and sit within existing national and regional assessments (the National Character Areas published by Natural England³ and the East of England Regional Landscape Framework⁴). Existing national and regional character areas shown on **Figure 1.1 – Landscape Character Context**.
- 1.13 The classifications for Essex County and the neighbouring authorities are illustrated on **Figure 1.2 – Neighbouring Character Areas**.

³ <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles>

⁴ <http://landscape-east.org.uk/sites/default/files/Landscape-East-EoE-LCT-Typology-Methodology-Dec09.pdf>



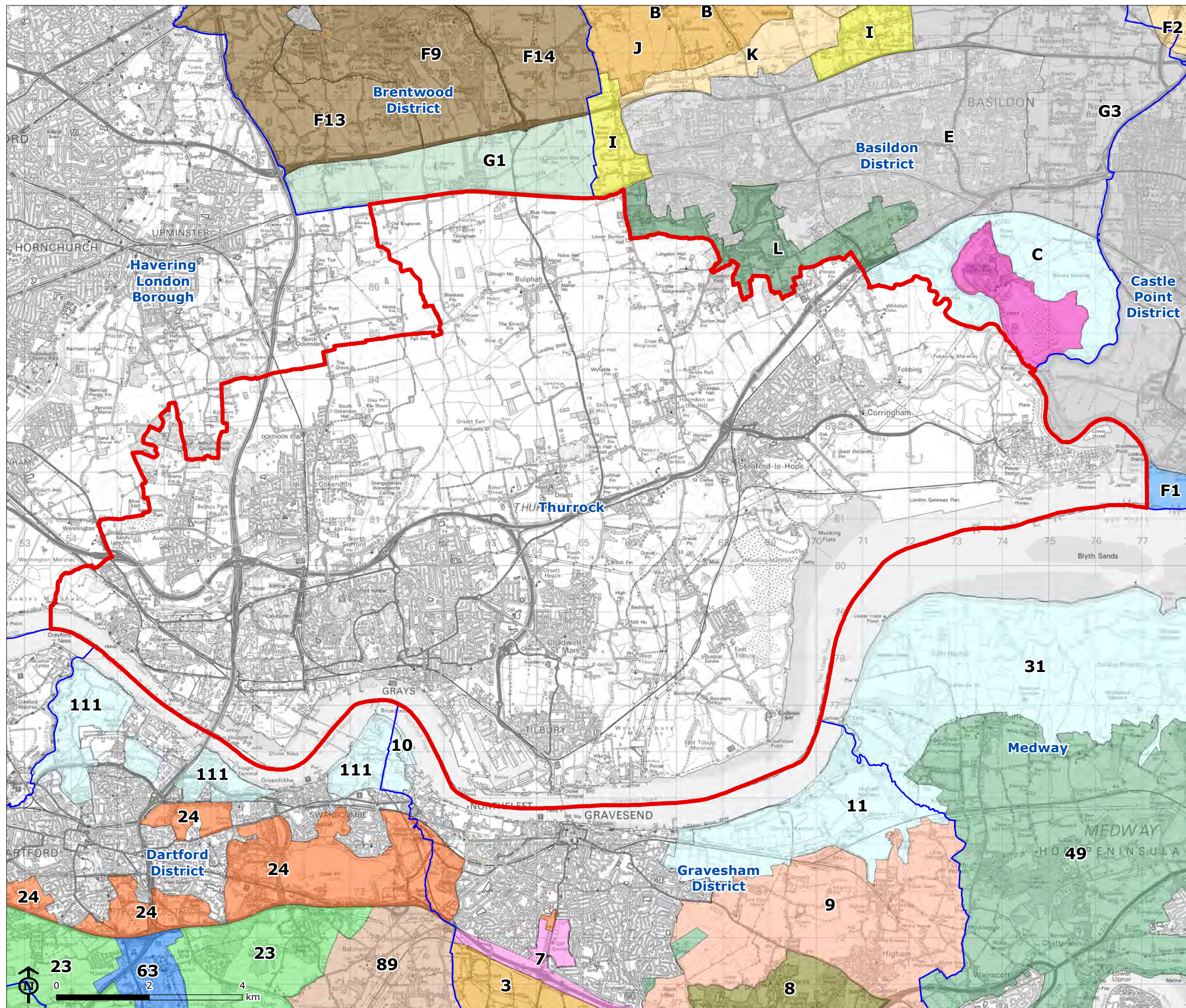
Thurrock Landscape Character Assessment

Figure 1.1: Landscape Character Context

- ▬ Study Area
- ▬ Local Authority boundary
- National Character Areas**
 - ▬ 111: Northern Thames Basin
 - ▬ 113: North Kent Plain
 - ▬ 81: Greater Thames Estuary
- East of England Regional Character Areas**
 - ▬ Coastal Levels
 - ▬ Estate Farmlands
 - ▬ Lowland Settled Claylands
 - ▬ Saltmarsh/Intertidal Flats
 - ▬ Urban
 - ▬ Valley Meadowlands
 - ▬ Valley Settled Farmlands
 - ▬ Wooded Farmlands
 - ▬ Wooded Hills and Ridges

Map Scale @ A3: 1:80,000





Thurrock Landscape Character Assessment

Figure 1.2: Neighbouring Character Areas

- Study Area**
- Local Authority boundary**
- Basildon LCA**
- Restored Landforms
 - B: Wooded Farmlands
 - C: Marshland
 - E: Urban Area
 - I: Lowland Claylands
 - J: Sloping Farmland
 - K: Lowland Farmlands
 - L: Wooded Hills & Ridges
- Brentwood LCA**
- Urban
 - F13: Great Warley Wooded Farmland
 - F14: Ingrave & Herongate Wooded Farmland
 - F9: Little Warley Wooded Farmland
 - G1: Horndon Fenland
- Gravesham LCA**
- 3: Istead Arable Farmlands
 - 7: Gravesend Southern Fringe
 - 8: Shorne Woodland
 - 9: Higham Arable Farmlands
 - 10: Botany Marshes
 - 11: Shorne and Higham Marshes
- Essex LCA**
- F1: Thames Estuary
 - F2: Crouch & Roach Farmland
 - G3: Urban
- Kent LCA**
- 23: Darenth Downs
 - 24: Dartford and Gravesend Fringes
 - 31: Eastern Thames Marshes
 - 49: Hoo Peninsula
 - 63: Lower Darent Valley
 - 86: Shorne
 - 89: Southfleet Arable Lands
 - 111: Western Thames Marshes

Note: LCA data unavailable for the London Boroughs of Havering and Bexley

Map Scale @ A3: 1:80,000



2 Methodology for the Landscape Character Assessment

Approach

- 2.1 The method for undertaking this consolidated Landscape Character Assessment follows the method promoted by Natural England through 'An Approach to Landscape Character Assessment' (2014)⁵, which embeds the principles of the European Landscape Convention (ELC) within it. It updates the previous 'Landscape Character Assessment: Guidance for England and Scotland', published by the Countryside Agency and Scottish Natural Heritage in 2002, though the methodology is broadly the same as the previous guidance.
- The 2014 guidance lists the five key principles for landscape character assessment as follows:
 - Landscape is everywhere and all landscape and seascape has character;
 - Landscape occurs at all scales and the process of Landscape Character Assessment can be undertaken at any scale;
 - The process of Landscape Character Assessment should involve an understanding of how the landscape is perceived and experienced by people;
 - A Landscape Character Assessment can provide a landscape evidence base to inform a range of decisions and applications;
 - A Landscape Character Assessment can provide an integrating spatial framework- a multitude of variables come together to give us our distinctive landscapes.
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 - A Landscape Character Assessment can provide a landscape evidence base to inform a range of decisions and applications;
 - A Landscape Character Assessment can provide an integrating spatial framework- a multitude of variables come together to give us our distinctive landscapes.
- 2.3 The assessment has been prepared within the framework set by Natural England's Natural Character Areas, and aims to join up with surrounding authorities' LCAs.
- 2.4 The process for undertaking the study involved five main stages, described below, namely:
- Desk Study;
 - Field survey;
 - Classification and Description;
 - Evaluation; and
 - Reporting and Consultation.

⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/396192/landscape-character-assessment.pdf
[accessed February 2015]

- 2.5 GIS was used throughout the study as the tool for collating, manipulating and presenting data.

Process of Assessment

Desk Study

- 2.6 This stage involved the collation and mapping of a wide range of existing information on the characteristics of Thurrock in GIS and analysing information to generate a draft classification for verification in the field.

Data

- 2.7 Data used within the report, including data collated in the GIS database, is shown in **Table 2.1**. Other sources that were consulted can be seen at **Appendix 3**.

Table 2.1: GIS Data

Name	Source
Base OS mapping at 1:25K and 1:25K	Ordnance Survey
Terrain 50 Contour data	Ordnance Survey
Bedrock & superficial geology 1:50K	BGS
Mineral extraction sites	Thurrock Council
Public rights of Way	Thurrock Council
Green Infrastructure data including green corridors and strategic views	Thurrock Council
River features & flood zones	Thurrock Council
Agricultural Land Classification	Natural England
Nature conservation designations	Natural England (national datasets) and Thurrock Council (local datasets)
Woodland	Thurrock Council
Historic Landscape Character Types	English Heritage
Historic Environment Character Zones	Thurrock Council
Historic evolution maps	CBA, digitised by Thurrock Council
Heritage designations	English Heritage (national datasets) and Thurrock Council (local datasets)
Registered Parks and Gardens	Thurrock Council
Thames chase Community Forest	Thurrock Council
Night skies and intrusion	CPRE

Field Survey

- 2.8 A field survey was undertaken to check the draft characterisation. This specifically focussed on:
- verifying and fine-tuning the classification of the landscape types and areas identified;
 - recording information on landscape character and characteristics and noting local variations in character;
 - identifying key sensitivities and valued attributes; and
 - assessing landscape quality (condition) i.e. the physical state of the landscape and its intactness.

Classification

- 2.9 Information collected in the field was incorporated into a revised classification at two different scales. These are described below.

Strategic scale

- 2.10 The strategic scale classification presents an overall landscape pattern. This pattern identifies types and areas of landscape which spread beyond the borough boundaries into neighbouring administrative areas and which spreads underneath settlements, highlighting differences in geology and landform.

- **Strategic Landscape Character Types** - which are generic and denote broad landscape types based on common combinations of geology, topography, vegetation and human influences that cross Local Authority Boundaries e.g. **Marshland**.
- **Strategic Landscape Character Areas** – which are discrete geographical areas of the strategic type e.g. **Thurrock Marshland**.

- 2.11 The strategic scale type and areas show how the different types of landscape flow under the urban areas and cross boundaries into adjacent administrative areas.

Local scale

- **Local Landscape Character Types** - which are generic and share common combinations of geology, topography, vegetation and human influences at the local scale e.g. **Undeveloped Marsh**.
- **Local Landscape Character Areas** - which are single and unique, discrete geographical areas of the landscape type at the local scale e.g. **Aveley Marshes**.

- 2.12 Reference is also made to localised variations in character within the local character areas, such as the Chadwell Scarp that forms an important landform feature along the south of the East and West Tilbury Open Undulating Farmland LCA.

Description

- 2.13 A map and brief description of the landscape character type is provided and the component landscape character areas listed.

- 2.14 Each landscape character area is then mapped, illustrated by three typical photos and described in terms of:

- Location and boundaries (with reference to key places/settlements and adjacent landscape character areas, including the nature of boundaries with adjacent areas);
- Key characteristics (the combination of elements which give the area its distinctive sense of place – bringing elements together to 'paint a picture');
- A detailed list of components that contribute to character (see **Table 2.2** for details and information sources).

- 2.15 Local variations in character within the landscape character area are also recorded as part of the description.

Table 2.2: Components that contribute to character

Landscape Component	Information sources
Geology	Bedrock geology – type and location Superficial geology – type and location Information source: 1:50K BGS Digital Geology maps
Topography	Height ranges AOD Land form and scale Undulating/ rolling/ valley form/ hills – forms enclosure/ openness Flat, simple, smooth, undulating/ dramatic, distinctive, complex, prominent, pronounced Information source: OS mapping and 3D topographical data, fieldwork
Hydrology	Direction of drainage, types of water course, flood zones Extent of alluvium for original river floodplains Information source: superficial geology & hydrology data
Soils	Soil type and Agricultural Land Classification Information source: British soil survey (hard copy) and ALC
Land Use	e.g. Farmland (pasture/ arable)/ urban/ mineral workings/ industry/ heathland/ commons/ orchards/ recreation/ parkland Information source: OS maps, Google Earth, fieldwork
Land Cover and Biodiversity	Main land cover types (NB record where particular habitats/ features are 'priority habitats' in the JNCC's Biodiversity Action Plan) or recognised through designation Degree of naturalness Landscape pattern – complex/ simple/ planned/ naturalistic / strong/ weak For agricultural landscapes: field pattern and size/ geometric or irregular/ types of field enclosure/ boundaries (e.g. hedges/ ditches/ fencing) Information source: JNCC's Biodiversity Action Plan, nature / ecology designations, Thurrock Biodiversity Study 2006-2011, surviving old trees & hedgerows(Thurrock internal document)
Settlement Pattern/ Form	Linear/ nucleated/ dense/ dispersed/ undeveloped Relationship between settlement pattern and geology/ field pattern/topography Settlement edge character e.g. raw, exposed/ well-integrated, contained Information source: maps, Conservation Area Appraisals, Urban Character Study, fieldwork
Building Style	Local vernacular & architectural styles Materials Information source: Conservation Area Appraisals, Urban Character Study, fieldwork
Historic Landscape and Time Depth	Overview of key historic landscape types and time depth Historic perspective on how the landscape character has evolved over time Surviving historic features, including those reflected in designations Information source: Historic Landscape Characterisations, designated heritage assets
Cultural Associations	References in art/ literature/ music/ travel writings Myth/ legend/ folklore Associations with people, events or important historical figures Information source: internet.
Scenic Qualities	Note what contributes to scenic quality and what detracts from it Describe composition of landscape elements – balanced/ harmonious or discordant/ disturbed Record features of visual interest/ visual detractors Information source: field survey
Perceptual Qualities	Relative sense of remoteness/ wildness/ tranquillity/ perceived naturalness/ sense of rurality Current level of human influence, intrusion, development Texture (smooth/ rough), smell, sound Noise and movement (calm/ busy) Intimate/ exposed Light intrusion/ night skies Information source: CPRE mapping, field survey

Landscape Component	Information sources
Visual Character and Views	Notable vantage points, sensitive views or promoted viewpoints Nature of views e.g. long, panoramic, framed, and character of views e.g. rural backdrops Inter-visibility with other landscape character areas Information source: strategic views set out on the Green grid Opportunities Map, Urban Character Study, field survey
Landmarks and Skylines	Note visually prominent hills/ ridges or skylines and their character (e.g. prominent, distinctive, undeveloped, wooded, settled) Note skyline features such as church spires/ monuments if they are prominent Information source: Urban Character Study, field survey
Landscape Function and Green Infrastructure	Function (e.g. provides a rural setting to a settlement or urban area/ a visual/ important gap/ special for recreation and amenity/ Green infrastructure function/ forms part of Thames Chase Community Forest) Information source: maps, Green Infrastructure Plan for Thurrock, field survey
Additional components recorded for urban areas	
Sense of place	Weak/ strong – what gives it sense of place? Information source: field survey
Connectivity	Pedestrian connections (good/ poor) Barriers to movement Information source: Urban Character Study 2007, field survey
Urban structure	Gateways, and nodes Historic cores Local shopping areas/ local centres Information source: Urban Character Study 2007

Maps

- 2.16 A series of maps is provided for each area illustrating:
- Topography and drainage (including main rivers and flood zones);
 - Historic map (Chapman and Andre 1777);
 - Designations and habitats (showing biodiversity and cultural heritage designations and priority habitats as set out in the JNCC's Biodiversity Action Plan);
 - Geology and minerals (showing surface geology and minerals sites).
- 2.17 For urban areas only the following maps are provided:
- Historic evolution of the building form (from mapping undertaken by Chris Blandford Associates as part of the Thurrock Urban Character Study in 2007, digitised by Thurrock Council);
 - Townscape experience (NB this is the mapping undertaken by Chris Blandford Associates as part of the Thurrock Urban Character Study in 2007, checked and updated as part of this study and digitised by Thurrock Council).
- 2.18 Note that these maps are intended to show a general overview for each character area rather than detailed information on individual features or assets. More information about all of these mapped elements is available in GIS from Thurrock Council.

Evaluation

- 2.19 The profiles for each landscape character area present a clear division between the characterisation and evaluation parts of the assessment. The evaluation covers:
- landscape quality/ condition i.e. the physical state of the landscape and its intactness;
 - past change that has affected the landscape;
 - key sensitivities and valued attributes (i.e. the landscape attributes that are of value, or particularly sensitive to change, covering what is important about the landscape and why);

- a vision for the landscape;
- guidance to conserve and enhance character and achieve the vision.

Consultation

- 2.20 A pilot assessment and draft report were circulated to Thurrock Council in April 2016 and comments taken on board to guide the scope and direction of the outputs. A full draft report was circulated for comment in December 2017.

3 The Evolution of the Thurrock Landscape

Overview of Thurrock's landscape

- 3.1 Thurrock is located on the northern bank of the River Thames where it expands into an estuary. Historically part of the county of Essex, Thurrock has been a Unitary Authority since 1998, and is bordered by Havering to the west, Basildon and Brentwood to the north and Castle Point to the east (See **Figure 3.1 – Location**). Thurrock is generally a low-lying area with a ridge running through from Langdon Hills Country Park on the Basildon boundary, through Horndon on the Hill and Grays to Aveley and Kennington Park in the west of the borough. There are two main rivers: the Thames which flows along the southern side, and the Mar Dyke which flows through the west of the borough from north to south, meeting the Thames at Purfleet.
- 3.2 As the focal point of the Thames Gateway Growth Area, Thurrock currently represents a key area for development and regeneration in the East of England and is consequently a diverse and ever-changing landscape. 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 windswept grazing marshes along the Thames riverside (see **Figure 3.2 – Light Pollution and Dark Skies**).
- 3.3 The level and expansive coastal grazing marsh landscapes within Thurrock stamp their identity on the borough. These vast open spaces have a wild and windswept character that is accentuated by broad expanses of sky. The marshland grasses create a constantly moving and changing tapestry of vegetation the character of which is influenced by the seasons and daily by light. Although marred by landfill sites and the clutter of pylons and power lines, the marshlands have an air of ancient permanence that contrasts sharply with the ever-changing urban forms adjacent to them. Of all the different landscapes within the Borough the intrinsic character of the marshland landscapes has remained essentially unchanged for centuries.
- 3.4 The Thames forms a distinctive 'rivers cape' along the southern edge of the Borough. In the west near Aveley Marshes, the Thames is narrow, widening towards Holehaven Creek in the east. The banks of the river are penetrated by large creeks, smaller inlets and bays. Numerous jetties, wharfs and piers punctuate the northern bank, which is heavily industrialised for most of its length between Aveley Marshes and Tilbury, and again around Holehaven Creek. The presence of industry creates a dramatic riverscape of angular machinery and buildings, dock activity, river traffic and changing light reflected on the constantly moving water of the Thames. This contrasts with adjacent open and low-lying marshes that accentuate the vertical features of the docks. Settlement has sprawled along an east-west band to the north of the river and at South Ockendon. Road and rail infrastructure, pylons and power lines are prominent features within the urban fringe landscapes.
- 3.5 In contrast to the densely settled and industrialised areas, northern parts of the Borough are rural in character and the topography more undulating. Large, open prairie fields are a distinctive feature of the large scale and exposed landscape character in this area. Despite the considerable loss of hedges the surviving boundaries, tracks and lanes preserve the broadly east west/ north south rectilinear pattern of land division which is characteristic and of ancient origin. The Bulphan basin is an area of fenland landscape that sits between two prominent ridges. Within this basin the distinctive field pattern and relict drainage features are evidence of the long history of land drainage and agricultural land reclamation within the Borough. A well-wooded ridge running between Romford and Basildon provides a subtle but distinctive horizon in views from low lying land to the south.

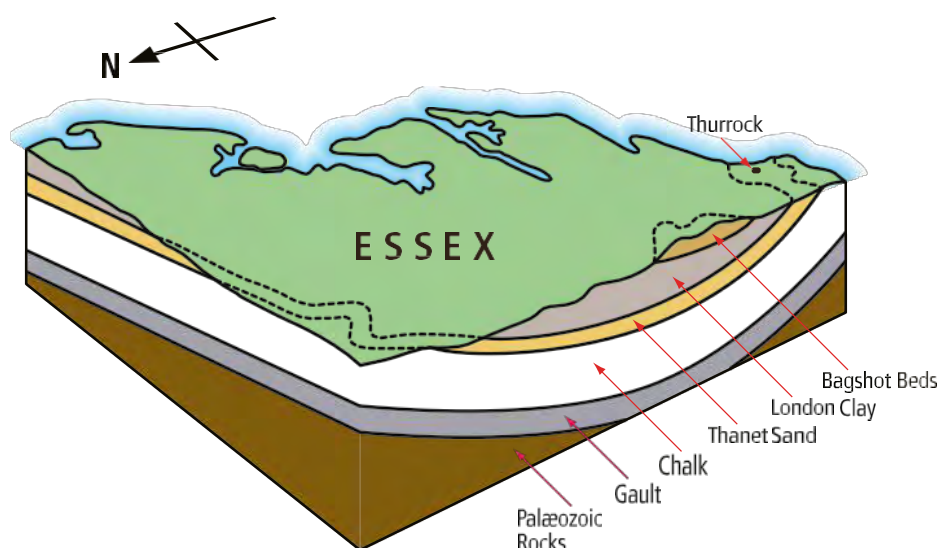
- 3.6 Many features and areas within the Thurrock landscape have been designated for their nature conservation, heritage and other environmental values (see **Figure 3.3 – Nature Conservation Designations**), and are key assets of Thurrock's landscapes.
- 3.7 The Thurrock landscape has evolved as a result of an interaction of the physical structure of the landscape and the vegetation and land uses that cover it.

Physical and Historical Influences on the Landscape

- 3.8 The basic structure of the landscape is fundamentally influenced by its underlying rocks and relief.
- 3.9 Geology and the processes of weathering, erosion and deposition influence the shape and form of the landscape and its drainage and soils. In turn, these influence patterns of vegetation and land use.

Geology⁶

- 3.10 See **Figure 3.4 – Bedrock Geology** and **Figure 3.5 – Superficial Geology**. The oldest rocks were laid down between 440 and 360 million years ago. They mainly consist of hard, slaty shales, mudstones and sandstones. Overlying this base is a number of different geological layers formed between 135 million years ago to the present.



Cross section through the bedrock geology of Essex. Illustration taken from the Chafford Geology information board at <http://www.geoessex.org.uk>. Copyrights GeoEssex 2014.

- 3.11 In the south of the borough, near Thurrock, Purfleet and Grays there is a band of upper chalk, exposed at the surface due to the folding of the tectonic plates millions of years ago. This is the oldest rock in the borough, and forms part of the foundations of the London Basin, a large basin-shaped structure beneath London and Essex. These rocks were extensively quarried for the Portland cement industry, particularly around West Thurrock and Grays. The rest of the geology in Thurrock is formed by subsequent deposits laid down on top of the band of chalk. This includes the Thanet Sand and the Lambeth Group (formerly commonly known as the Woolwich and Reading Beds) laid down in shallow marine conditions between 54 and 65 million years ago. Following a rise in sea level, the London Clay was deposited some 50 million years ago, a mud laid down across the whole region on the floor of a subtropical sea. This has yielded fine fossils of the sea's inhabitants all around the Essex Coast.

⁶ Information in this section is taken from <http://www.geoessex.org.uk>

- 3.12 The Lower Thames Terraces are fluvial deposits of sands and gravels in the south of the borough around Little Thurrock, Orsett Heath and Mucking. The Thames has numerous bench-like terraces on its edges, formed during subsequent cold (glacial) and warm (interglacial) stages, the oldest being at the highest elevation. Terraces are formed as the river slowly cuts down through successive flood plains creating new flood plains at lower levels. Each terrace contains fossils that reveal the flora and fauna of each of these periods. Geological sites in these terraces are now being re-examined and are revealing a wealth of information making them some of the most important sites in Europe for the study of this middle period of the Ice Age. For example at Aveley, a clay pit yielded the famous Aveley elephants, and Grays, which produced a huge quantity of fossil bones from the brick pits in the early 19th century. A large area of head deposits dominates the north of the Borough, interrupted by a layer of tidal river or creek deposits surrounding Mar Dyke.

Soils⁷

- 3.13 Excluding the urban areas where soils have not been mapped, there are five main soil types reflecting the underlying geology and pattern of drainage in the area.
- 3.14 In the marshland areas adjacent to the shores of the River Thames the low lying floodplain land less than 5m AOD, is dominated by clayey soils on marine alluvium with naturally high groundwater (Wallsea 1 Association). The land is generally used for winter cereals and ley grassland. In the Mar Dyke catchment are loamy and clayey floodplain soils with naturally high groundwater on the river alluvium (Fladbury 3 Association).
- 3.15 To the north east of the Borough away from the main rivers, there are seasonally waterlogged slowly permeable surface-water gley soils intersected by a network of drainage ditches (Windsor Association). Soils in the northwest - to the north of Aveley and Ockendon - are loamy with naturally high groundwater, which are gravelly and developed principally over low-level river terrace deposits (Hurst Association). Some of these soils are under arable cultivation.
- 3.16 In the east of the Borough around Orsett and East Tilbury and in the west of the Borough around Lower Mar Dyke and South of Aveley, there are freely draining slightly acid loamy soils (Fyfield 4 Association and Hucklebrook Association). These soils occur on the Thames Terrace Gravels, adjacent to and slightly above the floodplain of the Thames. These soils are some of the highest quality (Grade 2) Agricultural soils in Thurrock (see Figure **3.6 – Agricultural Land Classification**).

Topography and Hydrology

- 3.17 See **Figure 3.7 – Topography and Drainage**. Thurrock is generally low-lying, with the highest point in the northeast at Westley Heights (less than 116m AOD). In the River Thames floodplain and the surrounding marshes the land is generally lower than 10m AOD. North of the floodplain and surrounding marshes, where the geology alters from fluvial deposits to chalk and head, there is a small ridge up to 35m AOD. This ridge loops around the centre of the Borough from north of South Ockendon, south through Grays, south of Chadwell St. Mary and northwards east of Corringham. North of this ridge the land gently undulates rising up to Westley Heights. However there is a low-lying, broad, flat river floodplain centred around Mar Dyke near Bulphan.
- 3.18 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. Half a million years ago the alignment of the River Thames was vastly different to its present alignment, shaped by successive ice ages and dramatic changes in sea levels. The ancient flood plain is buried and potential archaeological discoveries are preserved beneath alluvium.

Land Cover and Ecological Character

- 3.19 See **Figure 3.8 – Priority Habitats**. The rural landscape is predominantly a mixture of arable and pasture, especially on the higher ground north of the slight ridge separating the floodplain

⁷ Soil Associations taken from the Soil Survey of England and Wales

from the rest of the Borough. The presence and distribution of the natural habitats found in the Borough are strongly influenced by geology and landform. Habitats include deciduous woodland, ancient and/or species rich hedgerows, grassland, heath, estuary and grazing marshes, freshwater and open water habitats. Many of the areas where these habitats occur are protected through statutory and non-statutory designation in recognition of their importance for nature conservation.

Deciduous Woodland

- 3.20 Small patches of lowland deciduous woodland, a priority habitat, are scattered throughout the Borough. Most of these occur on ground higher than 20m AOD. The largest area of woodland within the Borough is found at Langdon Hills Country Park. The woodland within this Country Park is a mixture of ancient and secondary woodland. Other areas of woodland are found at the base of disused quarries such as at Grays Thurrock Chalk Pit Site of Special Scientific Interest (SSSI) where the re-vegetation of the disused quarry includes examples of succession from young to old woodland areas.
- 3.21 In addition to these areas of woodland there are another 21 ancient and semi-natural woodlands within the Borough and one area of Ancient replanted woodland. Some of these relict fragments of ancient woodland are important habitats for protected species, such as Hangman's Woods, Dene holes for example.

Ancient and/or Species Rich Hedgerows

- 3.22 Ancient hedgerows provide field boundaries throughout the Borough. Many of these are remnants of former woodland and conserve some of the value of this habitat for numerous mammal, bird and insect species. Combined with natural grass strips and ditches, hedgerows provide vital links between fragmented habitats, allowing migration of wild plants and animals through the countryside.

Grassland

- 3.23 A mixture of different grassland types are found throughout the Borough. Lowland meadows of national significance are situated in the Borough. The alluvial floodplains of the Thames and its tributaries once supported large species-rich damp grassland used for pasture and hay production only. Fragments of these such as the largely neutral grassland of Basildon Meadows SSSI, remains within the Borough. The surviving fragments of unimproved grasslands (such as at Ferry Fields) and a combination of flower- rich grasslands and/or sparse, dry grassland associated with the sands, gravels and silts of various 'brown field' sites (such as old sand pits, brick pits, quarries, silt lagoons and former agricultural land) provide favourable conditions for the nationally important Thames Terrace grassland invertebrate assemblage.

Heathland

- 3.24 Heathland habitats are predominantly found in the south of the Borough around Orsett, Mucking, West Tilbury and in the west of the Borough around south Ockendon and North Stifford. Lowland Heath is a UK and Essex Biodiversity Priority Habitat. It is characterised by a range of dwarf shrub and/or acidic grassland vegetation occurring on dry, sandy, nutrient poor soils below 300m in altitude. The open dry habitat creates conditions ideal for a range of rare reptiles, birds and insects.

Estuary and Grazing Marshes

- 3.25 The banks of the River Thames estuary are of international, national and local significance. The Thames Estuary & Marshes SPA and Ramsar Site, Mucking Flats and Marshes SSSI, SPA & Ramsar Site, West Thurrock Lagoon and Marshes SSSI, Holehaven Creek SSSI and Vange and Fobbing Marshes SSSI are all located on the River Thames shore. The designated areas provide a complex of brackish, floodplain grazing marshes, ditches, saline lagoons and intertidal saltmarsh and mudflat. The variety of habitats supports internationally important numbers of wintering waterfowl with saltmarsh and grazing marsh being of international importance for their diverse assemblages of wetland plants and invertebrates.

- 3.26 In addition to expanses of saltmarshes and mudflats the Inner Thames Marshes SSSI form the largest remaining expanse of wetland bordering the upper reaches of the Thames Estuary. The site comprises a major relic of low-lying grazing marsh with a variety of grassland communities dissected by a network of fresh to brackish water drains. This type of habitat supports a variety of breeding birds and high numbers of wintering wildfowl, wader, finches and birds of prey as well as nationally scarce plant species.

Freshwater and Open Water

- 3.27 The River Thames and its tributaries are of local significance in terms of nature conservation. Reed beds are one of the important habitats found within the rivers and ditches in the Borough. They are a UK and Essex biodiversity priority habitat as several birds and numerous insect species are wholly dependent on this habitat.

Landscape Initiatives

- 3.28 **Figure 3.9 – Landscape Initiatives** shows areas of landscape which have been managed or restored for public recreation and enjoyment. Country Parks are owned and managed by Essex County Council⁸. They give local communities access to open spaces, woodland trails and historic parklands, as well as protect and encourage rare and important plants and animals.
- 3.29 The Thames Chase Community Forest covers 40 square miles of countryside around the London/Essex borders. It is an initiative that aims to improve and restore the landscape for leisure and pleasure, focussed on woodland planting. See <http://www.thameschase.org.uk/about-thames-chase/thames-chase-plan>.

Cultural Influences on the Landscape⁹

- 3.30 The landscapes and settlement of the Borough have developed over time, and have seen periodic episodes of reuse, abandonment and remoulding since prehistoric times, to create the present day landscape. The important historic features that remain are recognised through designations and can be seen on **Figure 3.10 – Heritage Assets**.

Prehistory

- 3.31 These changes first began 300,000 years ago in the Palaeolithic period when people first settled in the area. The wildwood forests that covered the area were slowly cleared as people began to inhabit the Borough. Favoured areas for the early hunter-gatherers of the Palaeolithic and Mesolithic (c.10,000 to c.4,000 BC), were the rich and fertile river valleys. Fishing and hunting would have been the earliest forms of industry which has continued from the Palaeolithic to the present day. As agriculture was adopted in the Neolithic (c.4,000 to c.2,200 BC), land management practices dramatically altered, probably involving increased clearance of woodland, cultivation of crops, domestication of animals, introduction of pottery and more settled societies. The scheduled Causewayed Enclosure at Orsett (likely to have been a meeting site bound by ditches) dates from this period. The development of agriculture from the Neolithic to today has been a changing force in the character and type of landscape that is present today.
- 3.32 Prehistoric agricultural practices took place in a variety of field systems and open landscapes, where people used, reused and abandoned areas across generations. Although difficult to detect, some fields retain some or all of their early patterns from prehistoric and Roman field systems. Agricultural processes continued and intensified during the Bronze Age (c.2,200 to c.700 BC) and Iron Age (c.800BC to AD43). There is evidence of late Bronze Age settlement in the form of crop marks representing circular enclosures that would have had gates and contained roundhouses, some with associated field systems (for example at East Tilbury). There is also evidence of Bronze

⁸ <http://www.essex.gov.uk/Activities/Pages/Country-Parks.aspx>

⁹ Text from Thurrock Landscape Capacity Study, Chris Blandford Associates for Thurrock Council, 2005 with additional information drawn from the Thurrock Unitary historic Environmental Characterisation Project report (2009)

Age field systems at Mucking. Bronze axes recall the efforts of Bronze Age man in colonising the area.

- 3.33 As un-reclaimed environments, the marshes provide an important interface between the land and the water, and throughout prehistory and during historic periods have been an important resource for the area's residents. They not only provided a rich and varied source of food, including fish, eels, oysters and wildfowl but also served as the location for important early industrial activity such as salt making and pottery production. The manufacture of salt, which began in the Bronze Age, flourished in the early Roman period, turning most of the coastline at certain times into a smoky industrial landscape. The un-reclaimed marshes also provided an important area for sheep grazing; the salt in the rich coastal marshes providing protection, as they were less susceptible to drying out in summer, and the salt content limited the risk of foot rot and liver fluke.
- 3.34 People have always moved within the landscape for activities such as hunting, trading and for social reasons. Trackways, rivers and the coastal shores formed the earliest forms of route ways within Thurrock from prehistory onwards. It is these historic route ways that were precursors of the modern road system, and also had a significant influence on the siting of later settlement and other features within the landscape. The Iron Age brought an increased focus to settlement as the first 'towns' or 'Oppida' began to develop. A settlement has been excavated at Mucking comprising roundhouses set within a system of fields, tracks and enclosures.

Roman Thurrock

- 3.35 A range of Roman settlements have been identified across Thurrock. However, Roman settlement (c.43 to 410AD) was centred on the Roman Road towards Tilbury, which attests to the importance of this area as a major transport route in accessing the Thames and the historic crossing point to Cliffe. Pottery manufacture was widespread and Roman pottery kilns have been found at Mucking and Orsett.
- 3.36 The retention of the marshes and the reclamation of the marshland from the Roman period have left a number of sea walls and dykes within the area.

Early Medieval Thurrock

- 3.37 The majority of large villages and small towns throughout the area originate from the medieval period, which at that time comprised a dispersed pattern of church/hall complexes, isolated farms, hamlets and cottages. The largest settlements were Horndon on the Hill (a small wool town) and the coastal villages of Grays, Mucking, Corringham and Fobbing.
- 3.38 The name 'Thurrock' is thought to derive from the Saxon word 'turruc', which described the bottom of a ship, where water collects – possibly a reference to the shape of the land north of the River Thames, which was a key factor in the development of the area. 'Tilbury' may be of Saxon origin, 'Tilla' being the name of a chieftain and 'burg' referring to an ancient fort. Documents charting the early history of the area exist before the Domesday Book (1086), which makes an early mention of Aveley. 'Gray' takes its name from Henry de Grai who was granted the manor by Richard the Lionheart in 1195. As the Saxons settled in the area, they re-used many of the earlier settlements but also appear to have created new ones.

Medieval Thurrock

- 3.39 As the marshes became the perfect area for sheep pasture, the textile industry of the area gained in importance. By the 12th century wool was one of Britain's most important exports. This led to increase pressure of reclamation of the marshlands. Salt marshes had an advantage over the inland pasture for sheep husbandry, for the reasons identified above. It has also been suggested that the meat from these animals was of high quality, although mutton may have been regarded as a by-product.
- 3.40 Grants of markets in the 13th and 14th centuries built on many of the earlier settlement structures, and added to historic cores from which modern settlement has developed. Settlement densities and population levels fluctuated widely throughout the medieval period and across the

borough with a number of towns and villages abandoned, expanded and contracted. The settlement pattern consisted of a small number of market towns, small-nucleated villages and hamlets, and widespread dispersed settlement in the form of farms and cottages. Stanford-le-Hope, Corringham, Fobbing and Horndon on the Hill were all important medieval settlements. Fobbing, in particular, was a thriving medieval port exploiting the marshland grazing to the south and west and fishing and trading opportunities provided by the creeks and Thames estuary while Horndon-on-the-Hill had a magnificent Wool market. Moated manorial sites, which date from the 12 - 16th centuries, are scattered throughout the landscape.

- 3.41 Some examples of Medieval 'common land', upon which farmers had common rights to graze animals, remain today, for example at Orsett Fen, Parsonage Common on West Tilbury Marshes and The Green at West Tilbury. Important examples of medieval field patterns also survive in the landscape, for example the remnants of the medieval system of 'open field' cultivation at 'The Great Common Field', West Tilbury.
- 3.42 Defences were also established in this period - in 1539 long range guns were mounted in the blockhouses on the bank of the river at East Tilbury and Tilbury. These were later to become the Fort at Tilbury.
- 3.43 As farming began to enclose the landscape, new features were created. Parks began in the medieval period. Owned by the nobility, they traditionally held stocks of deer which would be hunted within a bounded wood. Deer were not the only favoured delicacy, and during the late 16th and 17th centuries the Essex marshes became a key area for wildfowl hunting. During and after the medieval period, much of the landscape underwent piecemeal enclosure, whereby the land was rationalised into consolidated private ownership through a series of private land exchanges and through gradual enclosure of woodland, forest, heath and common. Chalk was dug, largely for agricultural purposes, from small mines known as 'deneholes', some of which survive in Hangman's Wood.

Post-Medieval Thurrock

- 3.44 A major feature of the 17th century was the reclamation of marshland, using Dutch technology to drain the marsh in a piecemeal fashion. This early drained marsh can be recognised by winding field boundaries (the line of the original creeks). The 17th century also marked a new threshold in the architectural development of Thurrock with the building of manor houses, many on the early estates of the medieval period. These were usually set within parkland landscapes designed in formal styles influenced by the fashions of the Continent, for example Belhus Park, designed by Capability Brown.
- 3.45 Tilbury Fort was built on the site of a hermitage dissolved by Henry in 1536 and it was extended in 1588. In 1667, Charles II rebuilt English fortifications along the Thames and the fort remains a prominent landmark in the landscape today. In 1760 gunpowder magazines were built at Purfleet, an important government gunpowder store and testing establishment.
- 3.46 By the 18th century expansion of the communication network began with the construction of turnpikes. There was renewed interest in reclamation of the marshes at the end of the 18th century. This period of reclamation, which continued into the 19th century is characterised by straight field boundaries.
- 3.47 The 19th century saw development of the railways (including the London Tilbury Southend railway in 1854) and larger dock facilities all of which led to the expansion of some of the small towns within the area and an agricultural decline. The coming of the railways significantly changed the typical agricultural character of Thurrock with farm holdings being divided up into smaller parcels of land. Some piecemeal development also occurred as a result. Purfleet, for example, became a river resort popular with day-trippers from London. By 1835 the population was just over 10,000. The extraction industry in Thurrock also began to develop rapidly from the 18th century, with chalk, clay, sand and gravel being quarried.
- 3.48 A short distance along the riverside, fears of a French invasion in the 1860s prompted the building of Coalhouse Fort, a Victorian casement fort, where building work was carried out under the supervision of Lt General Gordon, later to become known as Gordon of Khartoum.

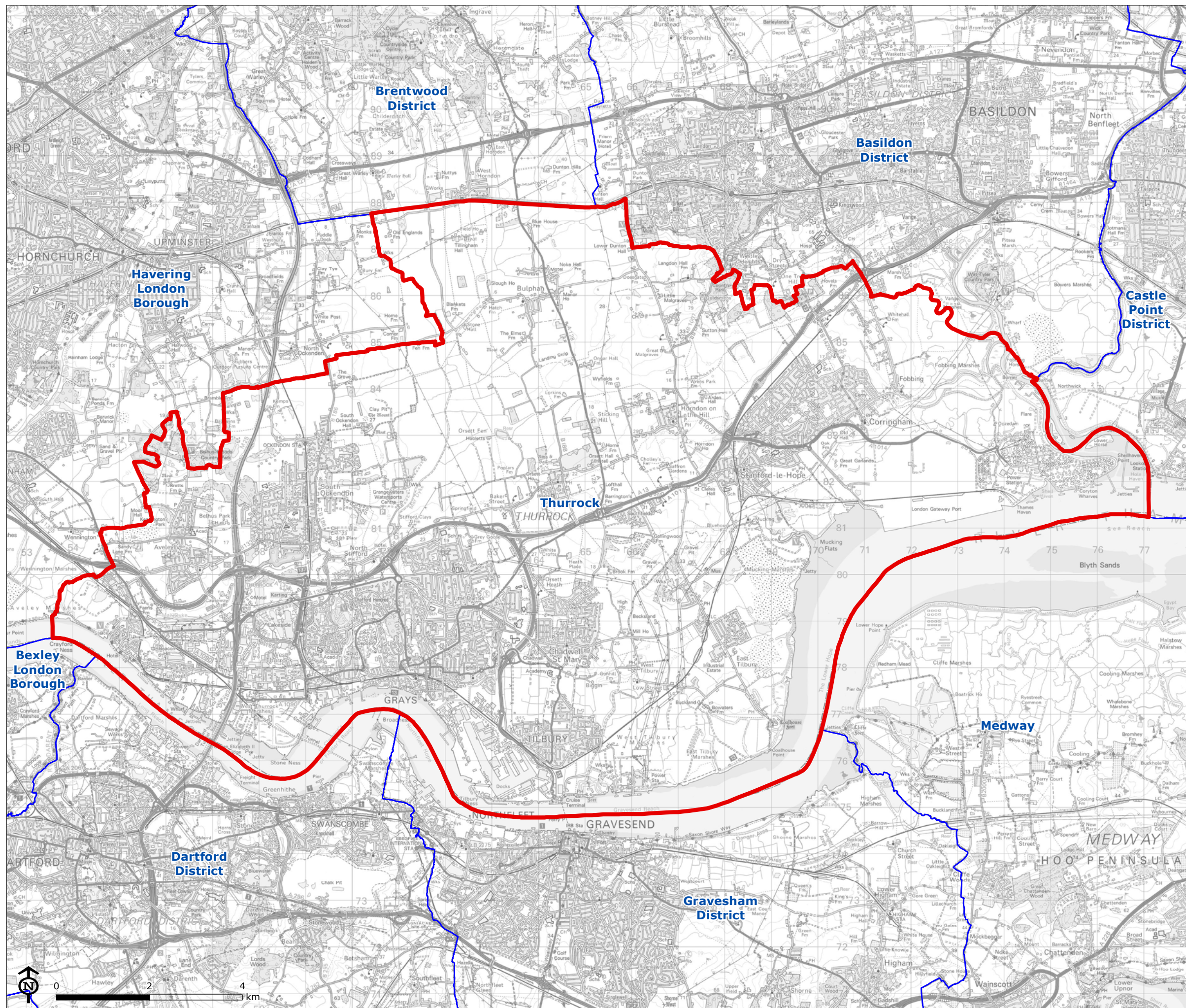
- 3.49 The population grew steadily during the mid-19th century, when industry began developing downstream from London and this accelerated dramatically towards the turn of the century when the Port of Tilbury opened, bringing in thousands of dock workers and their families, swelling the town of Tilbury. It was during this time that the first cement was manufactured at West Thurrock, establishing a tradition of heavy industry in the borough.

20th Century Thurrock

- 3.50 In the 20th century this pattern of new and expanding settlement in the Borough gained a new pace and direction. Power plants and oil storage facilities developed along the Thames and the river banks were gradually lined with the docks, whilst residential areas expanded, generally looking away from the river and industry. Defensive structures also continued to be constructed throughout this period, for example the Purfleet rifle range in 1909, and a number of Second World War defences along the Thames. Prior to the Second World War, plotlands, areas of land commonly found on landowner estates, were features of the landscape. These were often owned by people from London who would enjoy some respite out of the City of a weekend. During the war, these plots provided lesser risk of bombing and therefore the owners would reside in them on a more permanent basis. In the second half of the century, Thurrock's growth accelerated as thousands of families from war-torn London moved to overspill estates at Aveley and South Ockendon with many small agricultural settlements and plotlands expanded and developed to accommodate the numbers fleeing London. With so many residents having links with the capital and its reliance on the Thames, Thurrock's focus continued to be westward towards London, rather than towards the rest of Essex.
- 3.51 The building of the QEII bridge, and the construction of the M25 and A13 have had a considerable impact on Thurrock by increasing the volume of traffic and hence noise intrusion and the creation of barriers to movement.
- 3.52 Mineral extraction is still evident in the area with some relic sites having been restored for leisure and recreational use, ecological value as well as for waste management. (See **Figure 3.11 – Minerals**).

21st Century Thurrock

- 3.53 Industrial development has long been part of the landscape. Despite this, there is still growing pressure for greater development in this area due to its prime location for trade and transport connections.



Thurrock Landscape Character Assessment

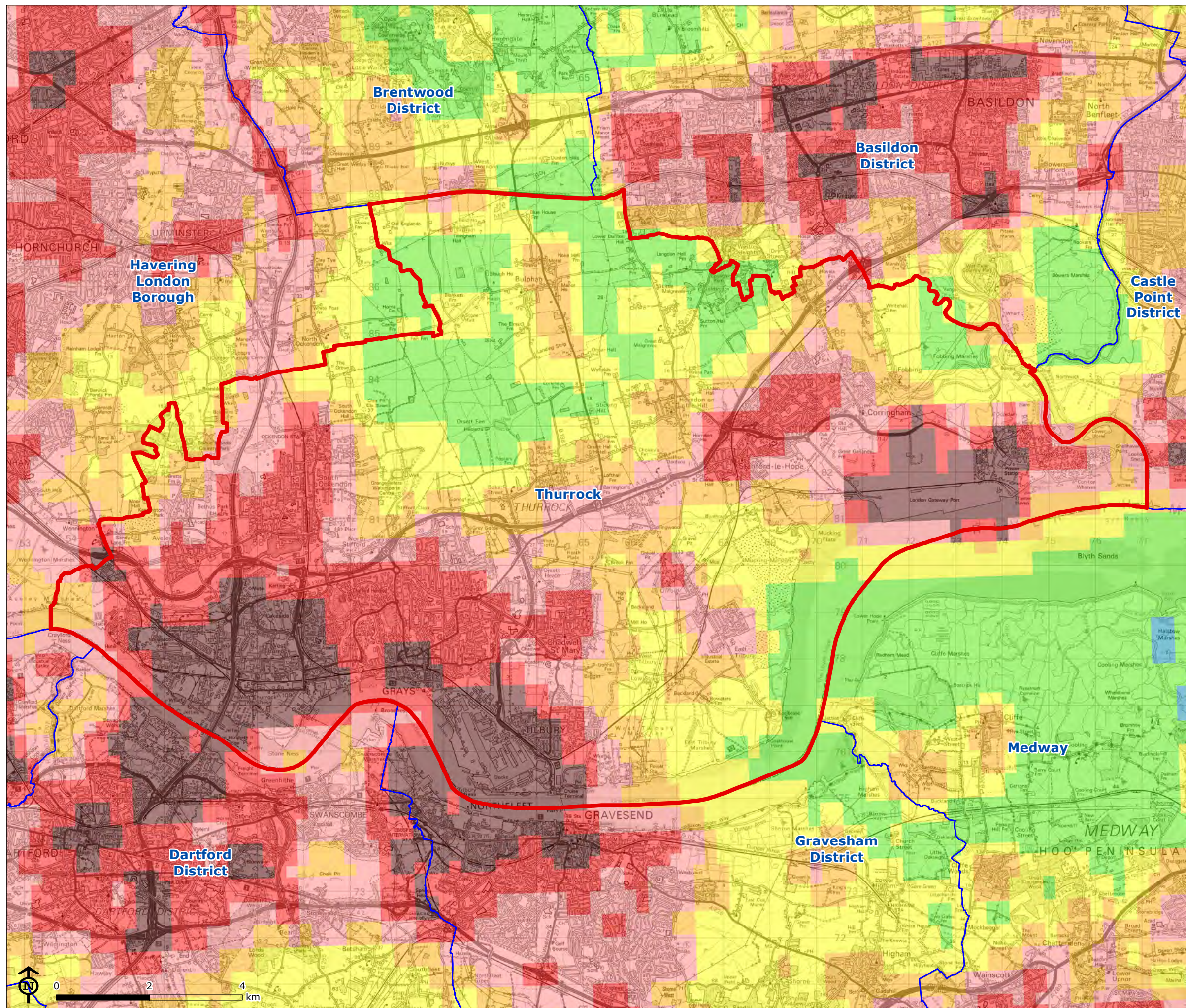
Figure 3.1: Location

-  Study Area
-  Local Authority boundary



Map Scale @ A3: 1:80,000





Thurrock Landscape Character Assessment

Figure 3.2: Light Pollution & Dark Skies (2016)

- Study Area
- Local Authority boundary

Night Lights

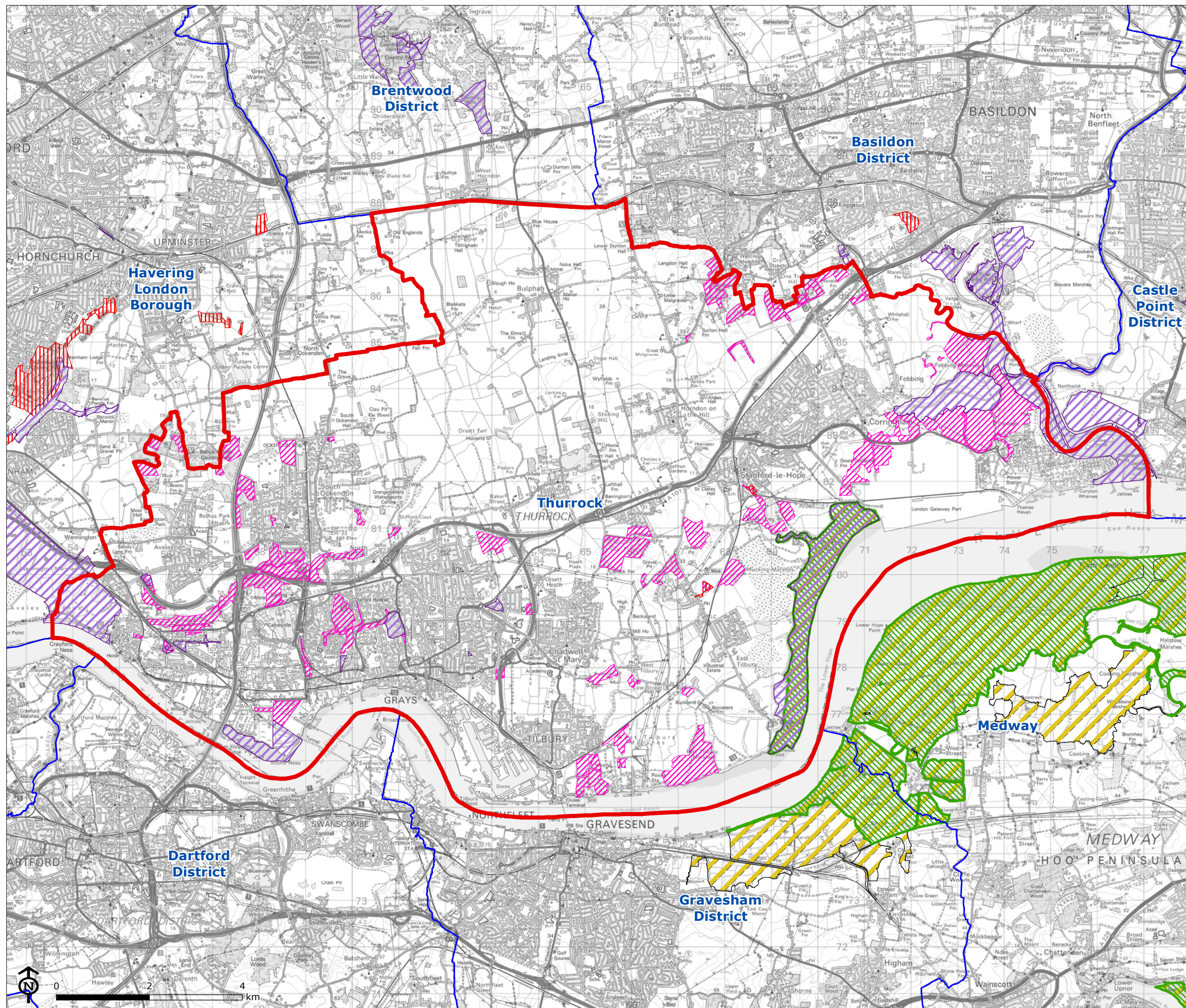
(NanoWatts / cm² / sr)



Source: CPRE's interactive maps of England's light pollution and dark skies, can be viewed online at <http://nightblight.cpre.org.uk/maps/>

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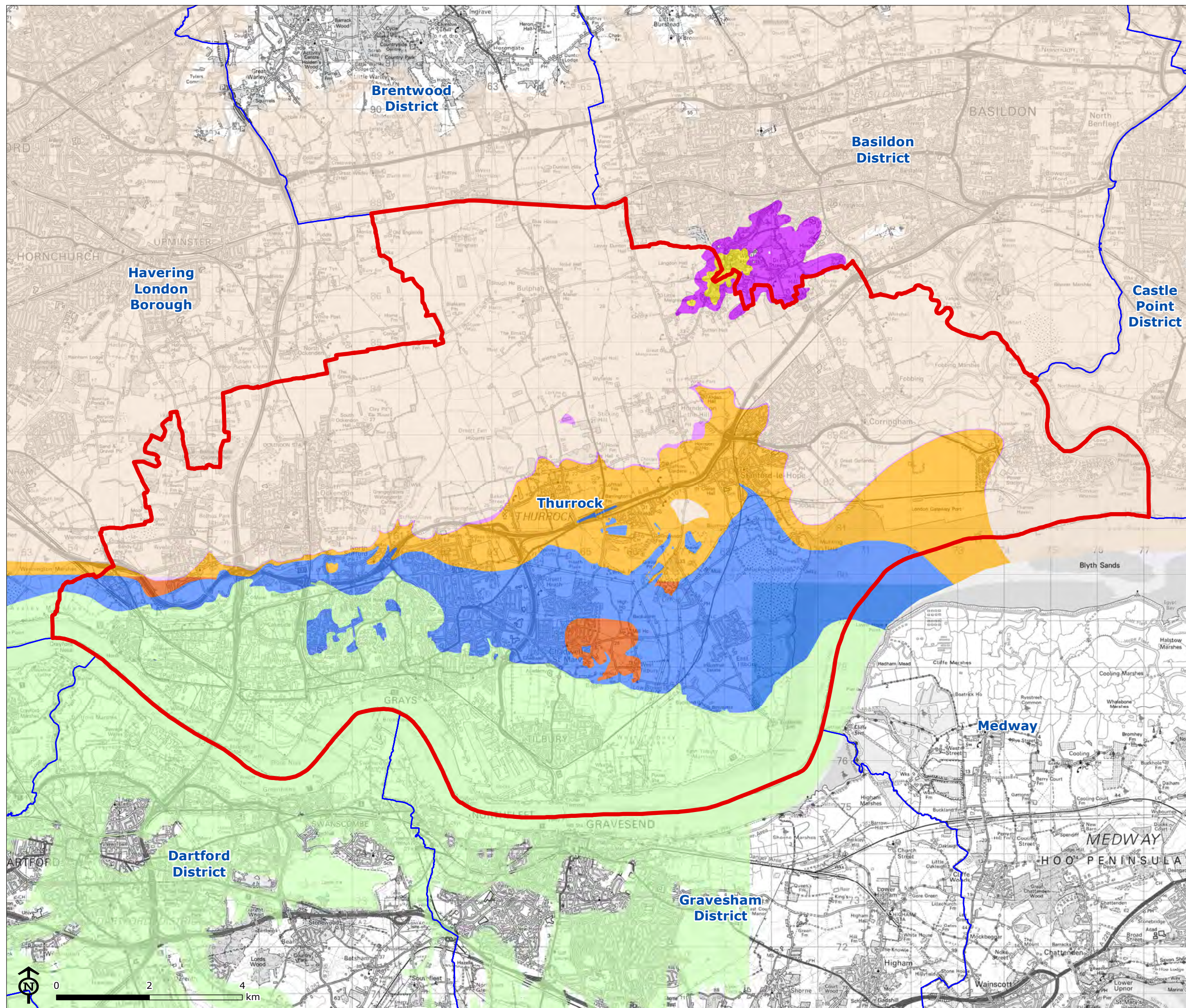
Thurrock Landscape Character Assessment

Figure 3.3: Nature Conservation Designations

- Study Area
- Local Authority boundary
- Ramsar site
- SSSI
- SPA
- LNR
- Local Wildlife Site

Map Scale @ A3: 1:80,000

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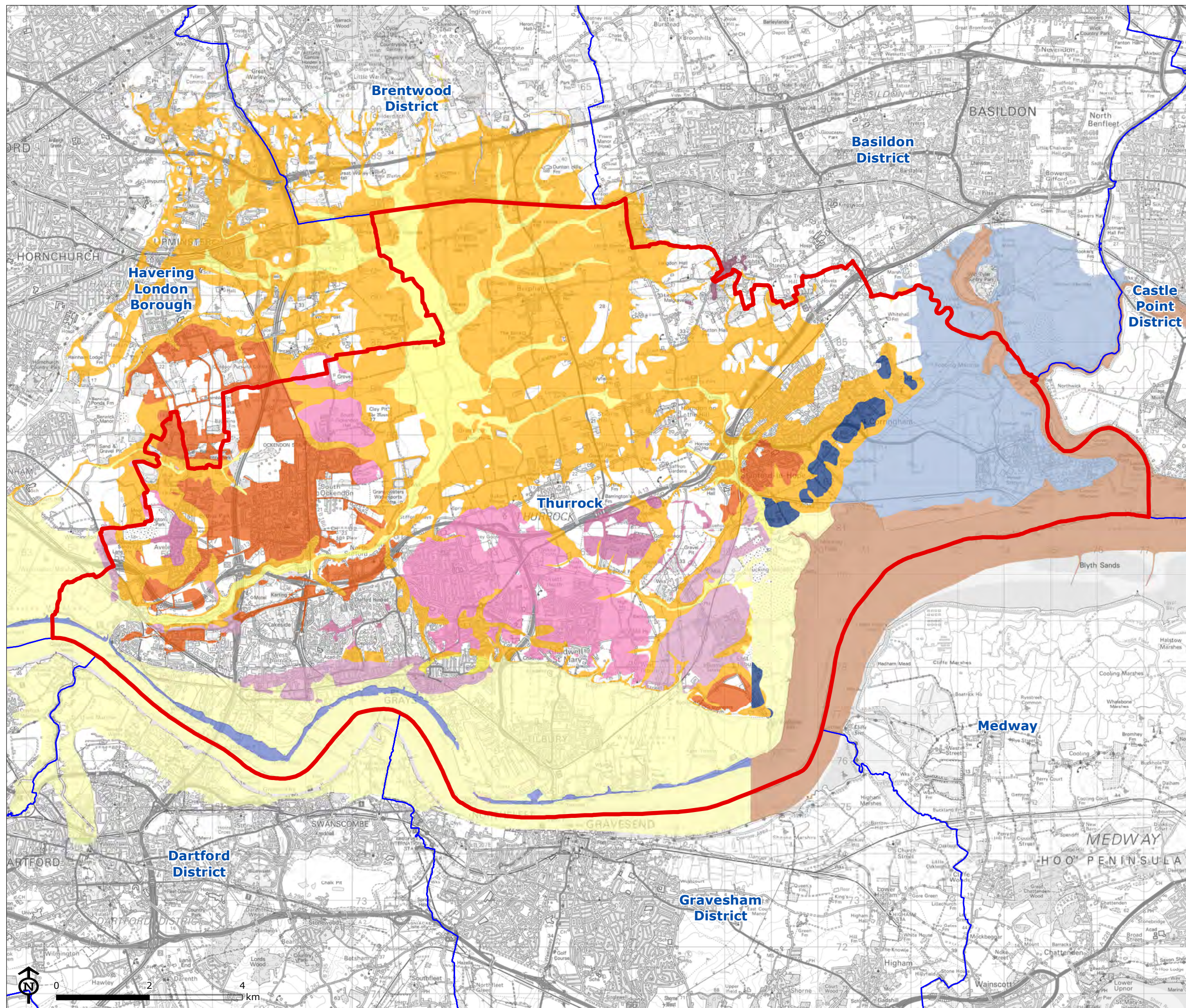
Thurrock Landscape Character Assessment

Figure 3.4: Bedrock Geology

- Study Area
- Local Authority boundary
- Bedrock Geology (BGS: DiGMapGB-50)**
 - Bagshot Formation - Sand
 - Claygate Member - Clay, silt and sand
 - Harwich Formation - Sand and gravel
 - London Clay Formation - Clay and silt
 - London Clay Formation - Clay, silt and sand
 - Lambeth Group - Clay, silt and sand
 - Lambeth Group - Sand, silt and clay
 - Thanet Formation - Sand
 - Thanet Formation - Sand, silt and clay
 - Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation - Chalk

Map Scale @ A3: 1:80,000

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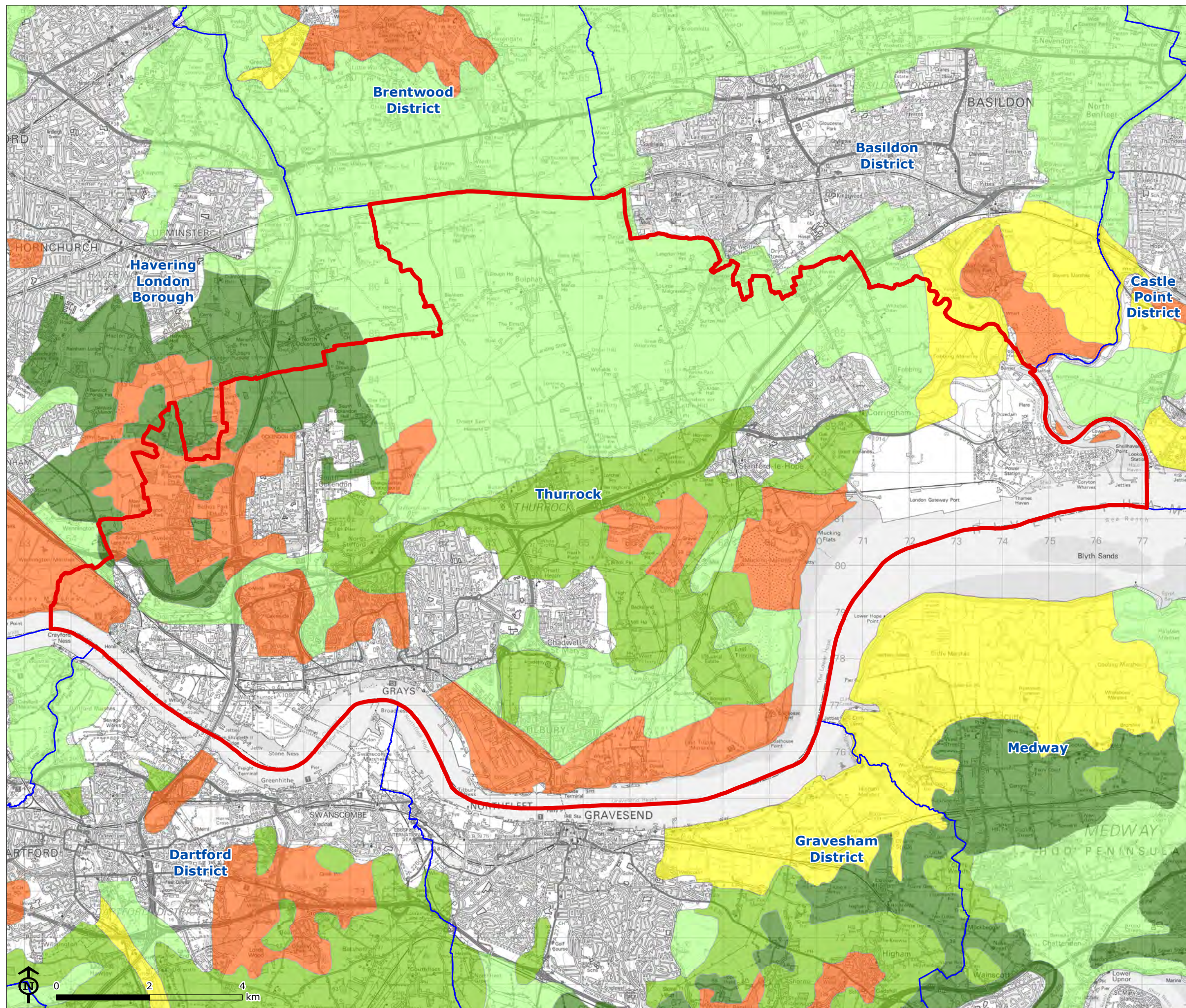
Thurrock Landscape Character Assessment

Figure 3.5: Superficial Geology

- Study Area
- Local Authority boundary
- Superficial Geology (BGS: DiGMapGB-50)**
 - Alluvium - Clay, silt, sand and peat
 - Alluvium - Clay, silt, sand and gravel
 - Alluvium - Silt and clay
 - Tidal Flat Deposits - Clay and silt
 - Tidal River or Creek Deposits - Clay and silt
 - Kempton Park Gravel Member - Sand and gravel
 - Hackney Gravel Member - Sand and gravel
 - Iford Silt Member - Clay and silt
 - Lynch Hill Gravel Member - Sand and gravel
 - Taplow Gravel Member - Sand and gravel
 - Boyn Hill Gravel Member - Sand and gravel
 - Black Park Gravel Member - Sand and gravel
 - Stanmore Gravel Formation - Sand and gravel
 - Beach and Tidal Flat Deposits - Clay, silt and sand
 - Head - Clay, silt, sand and gravel
 - River Terrace Deposits - Sand and gravel

Map Scale @ A3: 1:80,000





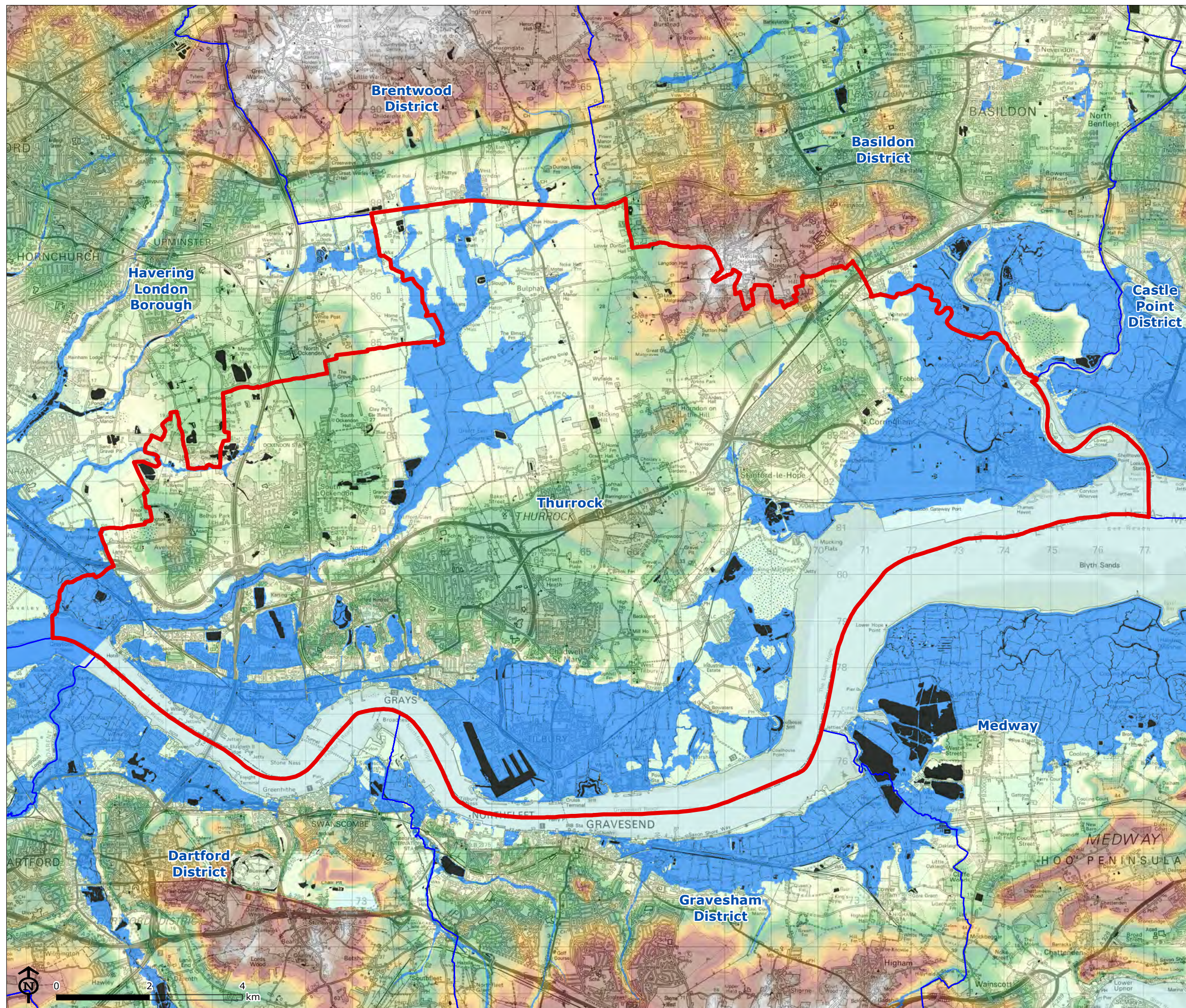
Thurrock Landscape Character Assessment

Figure 3.6: Agricultural Land Classification

-  Study Area
-  Local Authority boundary
- Agricultural Land Classification**
-  Grade 1
 -  Grade 2
 -  Grade 3
 -  Grade 4
 -  Non agricultural

Map Scale @ A3: 1:80,000





Thurrock Landscape Character Assessment

Figure 3.7: Topography and Drainage

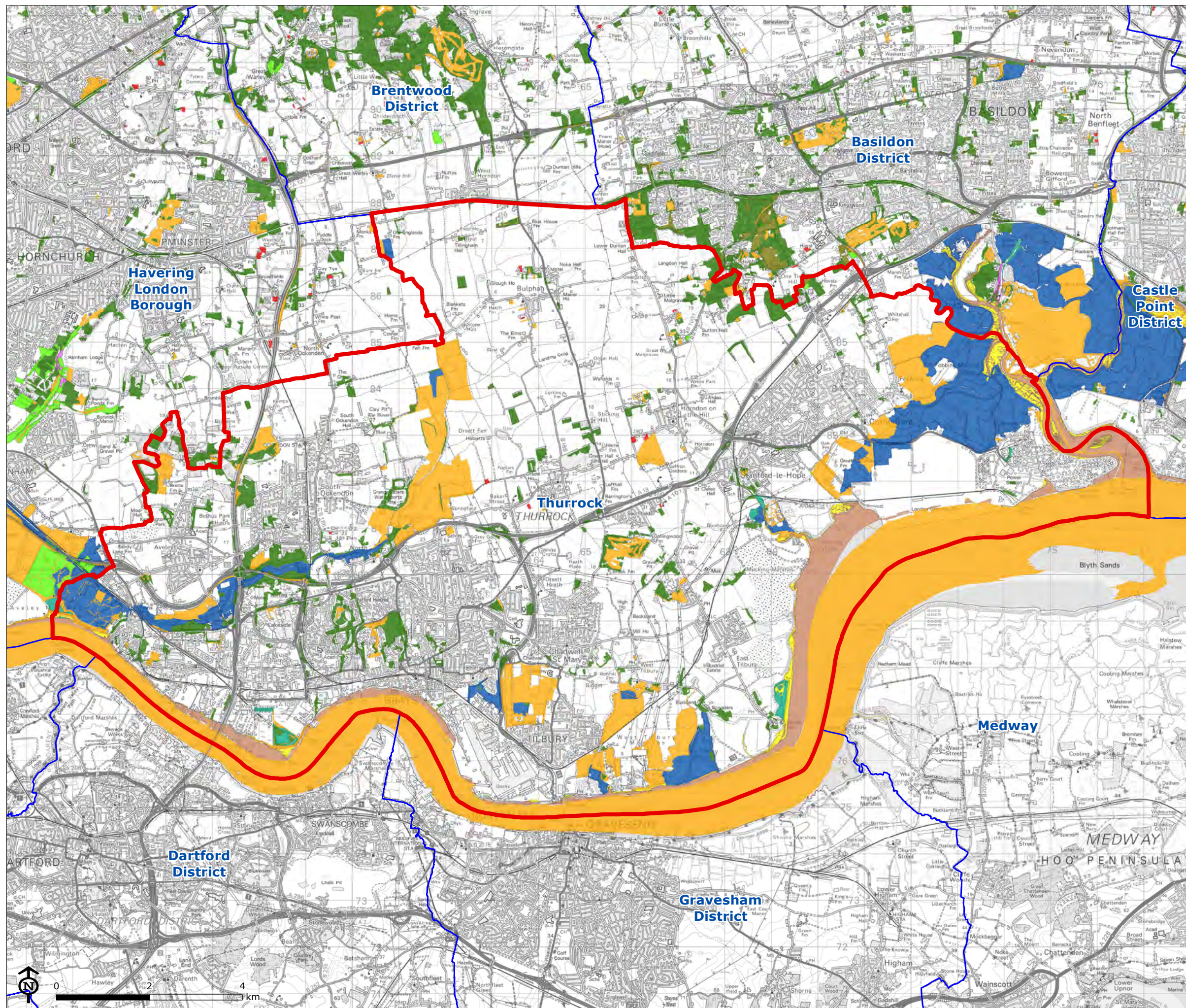
- ▬ Study Area
- ▬ Local Authority boundary
- Waterbody
- Flood zone 3

Elevation (Metres AOD)

- High : 118.6
- Low : -9.3

Map Scale @ A3: 1:80,000

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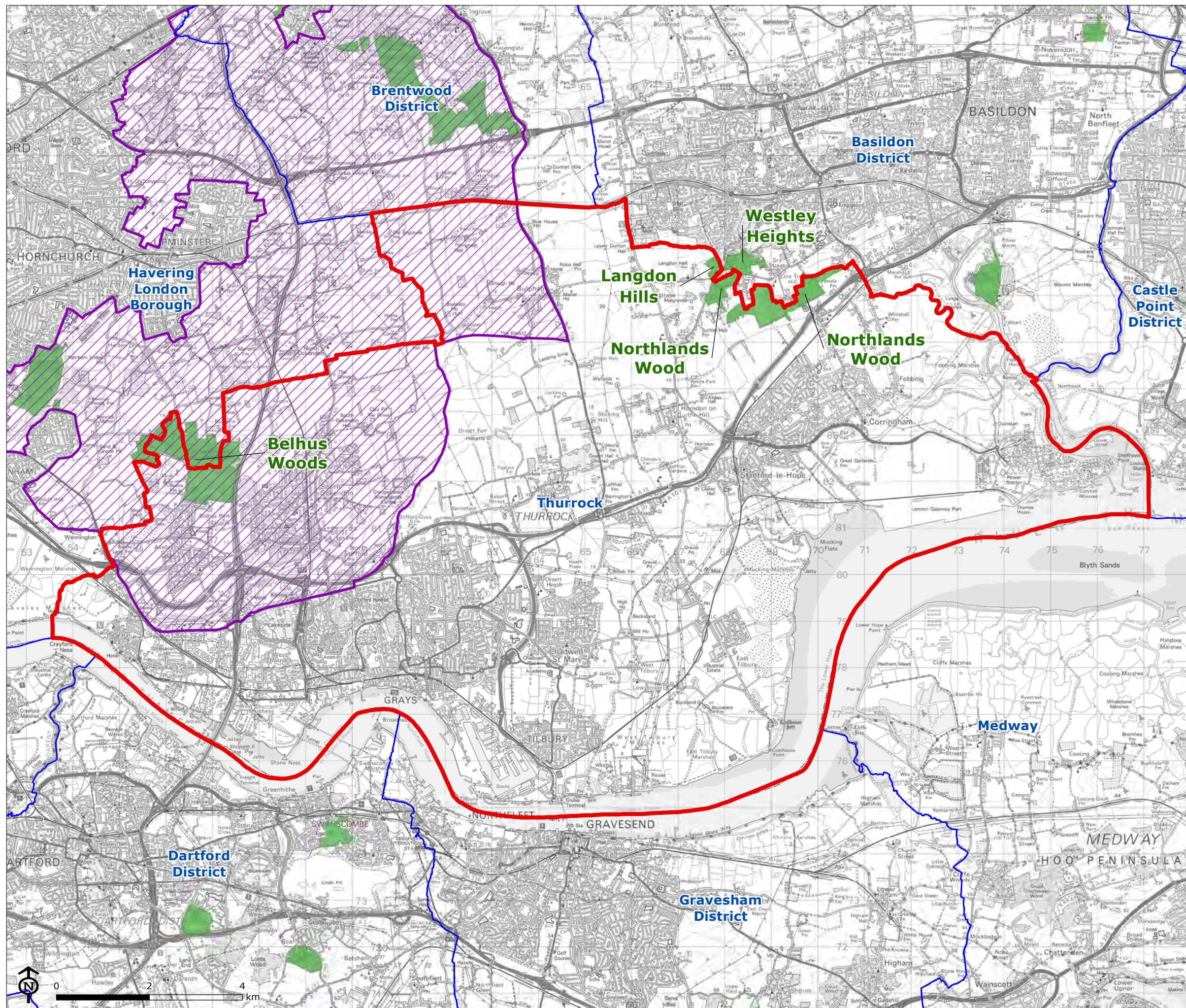
Thurrock Landscape Character Assessment

Figure 3.8: Priority Habitats

-  Study Area
-  Local Authority boundary
- Priority Habitat (source: Natural England)**
-  Coastal and floodplain grazing marsh
 -  Coastal saltmarsh
 -  Deciduous woodland
 -  Good quality semi-improved grassland
 -  Lowland fens
 -  Lowland meadows
 -  Mudflats
 -  Multi-habitat area
 -  Reedbeds
 -  Traditional orchard

Map Scale @ A3: 1:80,000

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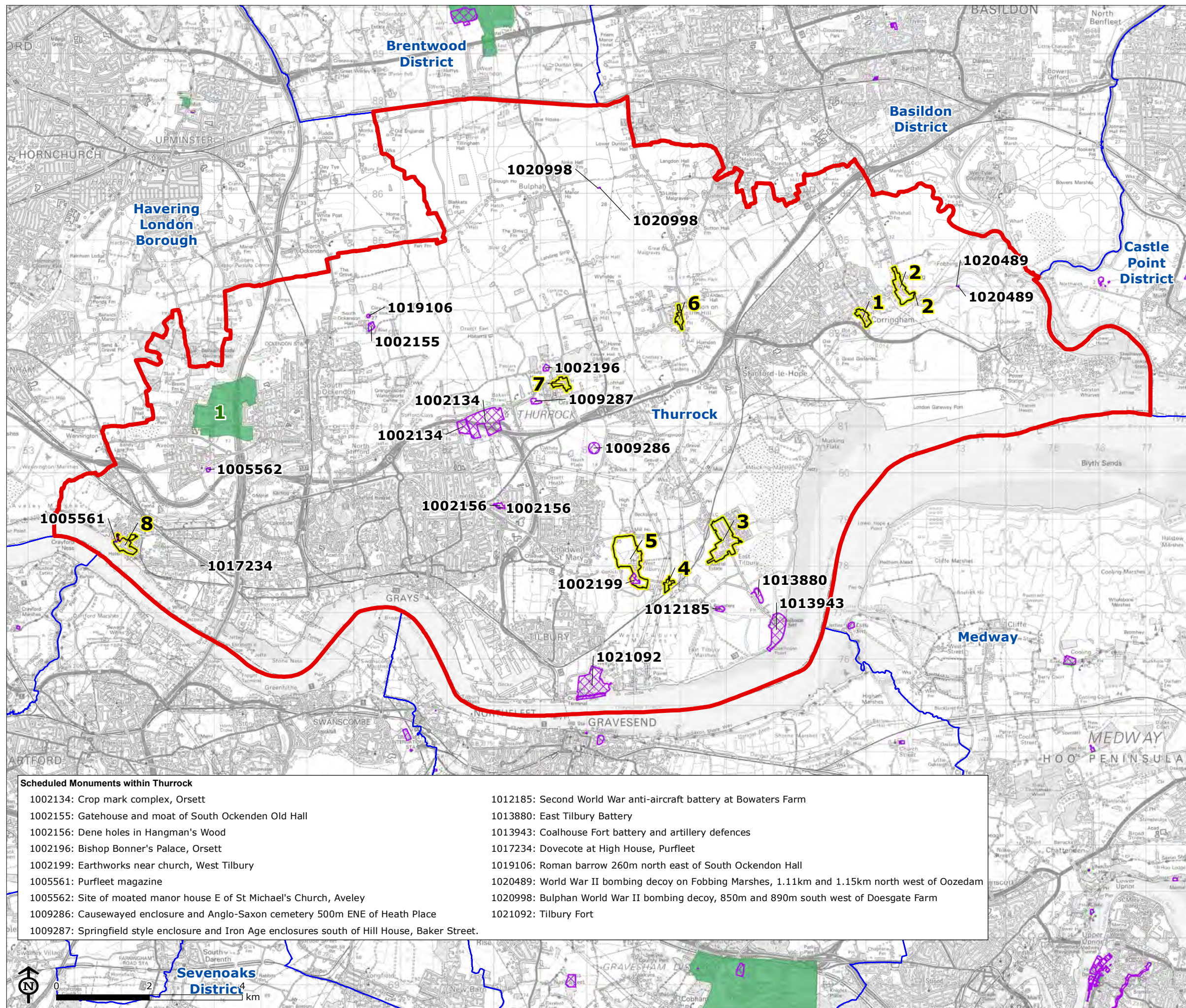
Thurrock Landscape Character Assessment

Figure 3.9: Landscape Initiatives

-  Study Area
-  Local Authority boundary
-  Thames Chase Community Forest
-  Country Park

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Thurrock Landscape Character Assessment

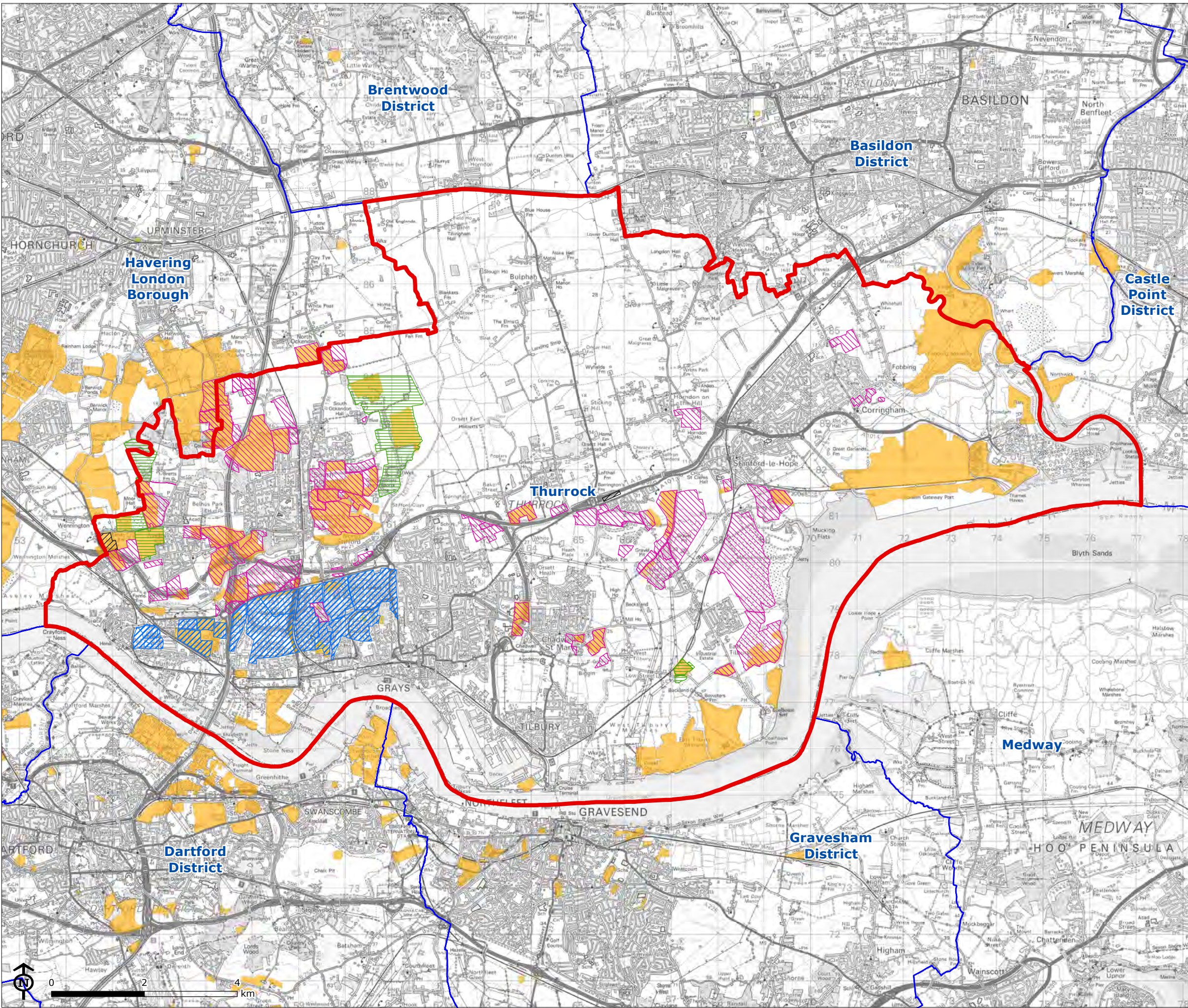
Figure 3.10: Heritage Assets

- Study Area
- Local Authority boundary
- Conservation Area
- 1: Corringham
- 2: Fobbing
- 3: East Tilbury
- 4: West Tilbury - Low Street
- 5: West Tilbury
- 6: Horndon-on-the-Hill
- 7: Orsett
- 8: Purfleet
- Registered Park and Garden
- 1: Belhus Park
- Scheduled Monument (see table in map view)

Scheduled Monuments within Thurrock	
1002134: Crop mark complex, Orsett	1012185: Second World War anti-aircraft battery at Bowaters Farm
1002155: Gatehouse and moat of South Ockenden Old Hall	1013880: East Tilbury Battery
1002156: Dene holes in Hangman's Wood	1013943: Coalhouse Fort battery and artillery defences
1002196: Bishop Bonner's Palace, Orsett	1017234: Dovecote at High House, Purfleet
1002199: Earthworks near church, West Tilbury	1019106: Roman barrow 260m north east of South Ockendon Hall
1005561: Purfleet magazine	1020489: World War II bombing decoy on Fobbing Marshes, 1.11km and 1.15km north west of Oozedam
1005562: Site of moated manor house E of St Michael's Church, Aveley	1020998: Bulphan World War II bombing decoy, 850m and 890m south west of Doesgate Farm
1009286: Causewayed enclosure and Anglo-Saxon cemetery 500m ENE of Heath Place	1021092: Tilbury Fort
1009287: Springfield style enclosure and Iron Age enclosures south of Hill House, Baker Street.	

Map Scale @ A3: 1:80,000





Thurrock Landscape
Character Assessment

Figure 3.11: Minerals

- Study Area
- Local Authority boundary
- Landfill site
- Mineral Extraction Sites (historical & current) - Type
 - Unknown
 - Chalk
 - Common Clay & Shale
 - Sand & gravel

Map Scale @ A3: 1:80,000

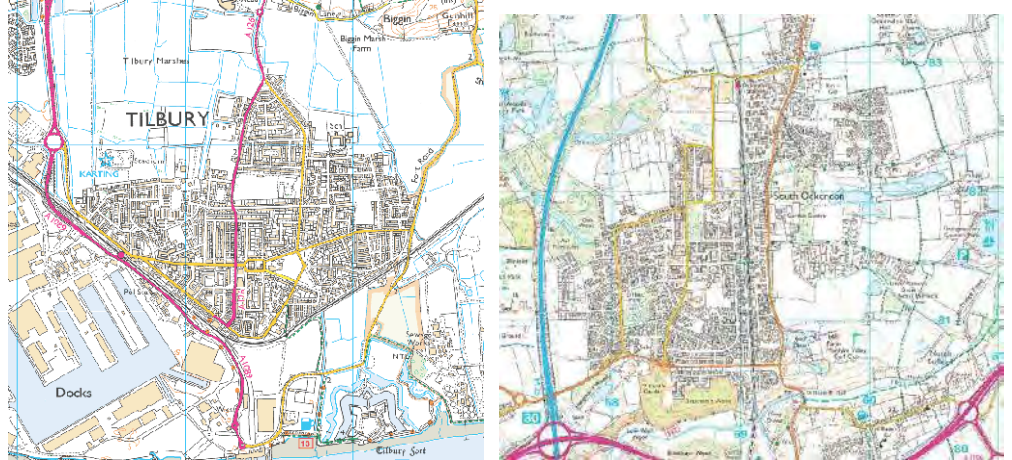


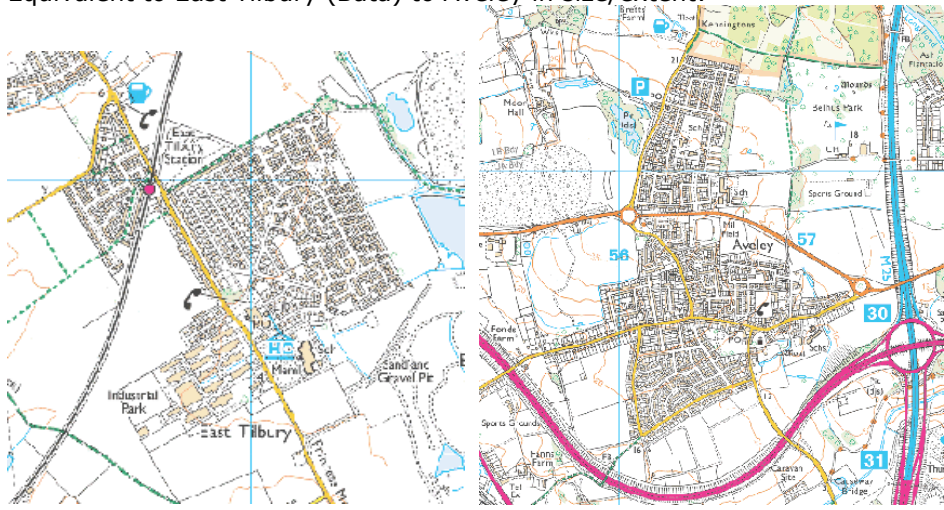
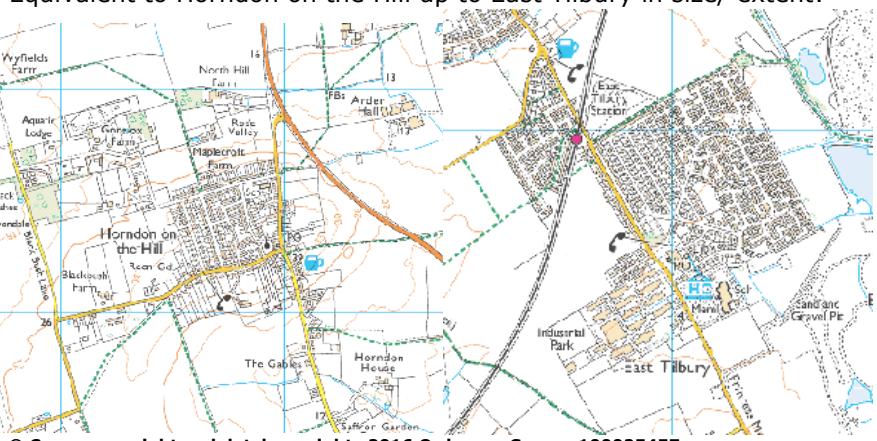
4 Forces for Change and Minimising Harm

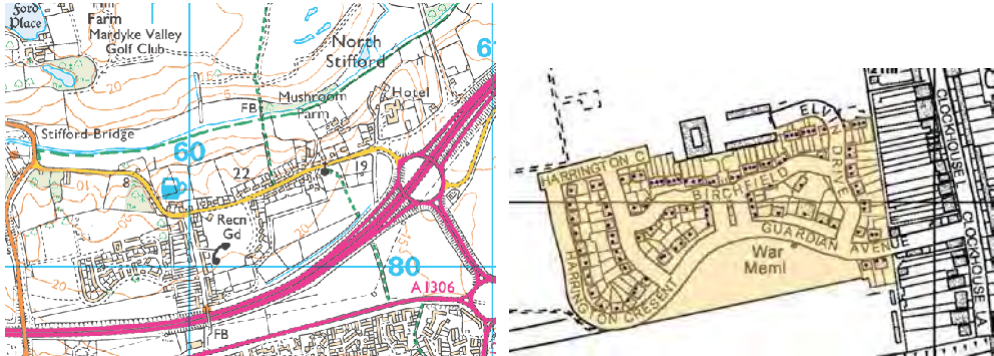
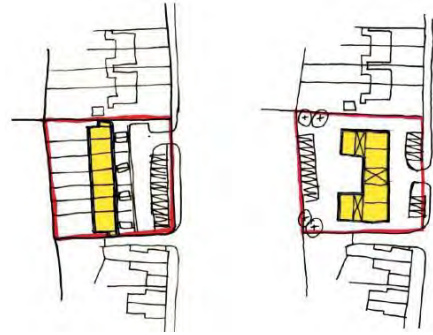
Forces for Change

- 4.1 Thurrock has long been under pressure for development of industry, housing, transport and defensive sites (as set out in Section 3), and there continues to be pressure for development due to Thurrock's prime location for trade and transport connections. The following table sets out the types of development that are facing Thurrock:

Table 4.1: Type of development in Thurrock

Development Scenarios	Description	Examples
Very large Housing Area over 3,000 dwellings (over 100 ha)	Sustainable Urban Extension including a new commercial centre and community facilities and services and mixed use. A mix of residential typologies including areas from higher density for example 85 dph and buildings up to 5 to 6 storey, to lower density for example 25 dph up to 2.5 storey. Open space provision to include a Community Park over 4 hectares.	Equivalent to Tilbury or South Ockendon in size/ extent (see below):  © Crown copyright and database rights 2016 Ordnance Survey 100025457

Development Scenarios	Description	Examples
Large Housing Area 1,000 to 3,999 dwellings (33 to 100 Ha)	Includes a new urban centre for community facilities and services. A mix of residential typologies including areas from medium density for example 60 dph and buildings up to 4 storey, and lower density for example 20 dph up to 2.5. Open space provision to include a Community Park over 4 hectares.	Equivalent to East Tilbury (Bata) to Aveley in size/extent:  © Crown copyright and database rights 2016 Ordnance Survey 100025457
Substantial Housing Area 300 to 499 dwellings (11 to 33 Ha)	1) close to centre urban areas - includes some community facilities. A mix of residential typologies including areas from very high to high 300 to 80dph 2) residential areas high to medium density for example 60 dph and buildings up to 4 storey, and lower density for example 20 dph up to 2.5 storey 3) rural setting, medium to low density for example terrace and single dwellings up to 2.5 storey between 20 and 35 dph	Equivalent to Horndon on the Hill up to East Tilbury in size/ extent:  © Crown copyright and database rights 2016 Ordnance Survey 100025457

Development Scenarios	Description	Examples
Small Housing Area 75 to 299 dwellings (2.5 to 11Ha)	1) urban areas high density for example 60 dph up to 4 / 5 storey 2) conventional suburban development in residential areas medium density for example 40 to 45 dph and buildings up to 3 storey 3) Garden city residential low density for example terrace and single dwellings up to 2.5 storeys between 20 and 30 dph	Equivalent to south-western part of North Stifford in size/ extent (see below):  © Crown copyright and database rights 2016 Ordnance Survey 100025457
Minor Housing, under 75 dwellings (or under 2.5 ha)	1) within urban centre – a proportion of ground floor community/ commercial, 3 up to 5 / 6 story flats, high to very high density for example 110 2) residential areas high to medium density for example 60 dph and buildings up to 3 storey, and lower density for example 20 dph up to 2.5storey 3) Suburban /rural setting, medium to low density for example terrace and single dwellings up to 2.5 storey between 20 and 35 dph,	

Development Scenarios	Description	Examples
Flats	5-10 storey (15-30m in height), very high density for example 420 dph	 Image copyright Ron Poulter
Tall structures	This category comprises buildings 23-53m e.g. large silos, tall office buildings, power station stacks or any other structures that are taller than a typical port warehouse height of 23m.	

Development Scenarios	Description	Examples
Major Warehouse/ Industry	Development with individual large and bulky buildings above 50,000 cubic metres. These developments also include vehicle movements, ancillary activities/storage, and flood lighting.	
Solar Farms above 5ha	This includes free standing field scale solar PV developments above 5ha. It comprises solar arrays mounted on racks (up to 3m high). These are often accompanied by on site inverter buildings, security fencing and CCTV cameras. They tend not to be lit at night.	

Development Scenarios	Description	Examples
Commercial Wind Turbines	This focuses on commercial wind turbines over 30m to tip. The movement of the blades is a unique feature of wind energy developments, setting them apart from other stationary tall structures in the landscape such as masts or pylons. Some turbines may need to be lit at night for aviation safety reasons, although it is possible to use infra-red lighting in sensitive areas so the assumption can be that they are unlit.	
Open storage	Large scale vehicle open storage 8-15Ha. Similar to lorry parks but less vehicle movement and activity. Assumed to include a small amount of security lighting but no flood lights.	

Development Scenarios	Description	Examples
Lorry Parks	This category includes major Lorry Parks for 3.5-8Ha (approximately 500 HGV). Can include either open HGV park or private HGV park for a logistics company. Includes floodlighting and continuous HGV movements.	
Minerals and waste sites	This category includes mineral extraction and waste disposal (landfill) sites. This involves landform changes (permanent ground disturbance), noise and vehicle impacts. No lighting or ancillary buildings. NB There are a number of schemes to restore previous landfill sites in Thurrock. Not all meet current standards.	

Potential effects of development on the landscape and minimising harm

- 4.2 The introduction of the types of development listed above into Thurrock would adversely affect the landscape. The table below raises potential issues with each development type as well as an indication of types of landscape with lower sensitivity¹⁰ to that type of development. The guidance aims to set out how to minimise harm through siting and design. Also see individual character descriptions for further guidance.

Table 4.2: Potential impacts and sensitivity

Development Scenario	Potential impacts on landscape character	Indication of areas with lower sensitivity	Guidance on minimising harm
Very large Housing Area over 3,000 dwellings (over 100 ha)	This type of development may result in direct loss of landscape features, increase the perceived human influence on the landscape and reduce the rural character of the landscape ('suburbanisation' of the landscape). Housing developments of this size including new commerce and community facilities and buildings up to 5 to 6 storeys would alter the scale of smaller scale or intimate landscapes and the character of rural landscapes.	Urban areas; large scale landscapes with lack of history/ time depth or that have been previously been altered; areas with less of a rural or wild character.	- Protect the hedgerow network, trees, woodlands, and semi- natural or unimproved grassland sites and aim to extend these as part of any landscape scheme associated with development. - Ensure any developments are high quality and designed using local architectural styles and materials to ensure they fit into their context, this is particularly important in or close to rural contexts (avoid 'suburbanisation' of the rural landscape). - New development (or redevelopment) may provide the opportunity to reinforce local identity and 'sense of place', and improve the structure, quality and legibility of existing urban areas. - Protect undeveloped skylines and backdrops from encroachment – set any new built development back from scarp edges or valley crests and avoid highly visible slopes. - Ensure prominent landmark features (particularly historic features) remain prominent in the landscape and new development does not detract from these features.
Large Housing Area 1,000 to 3,999 dwellings (33 to 100 Ha)	This type of development may result in direct loss of landscape features, increase the perceived human influence on the landscape and reduce the rural character of the landscape ('suburbanisation' of the landscape). Housing developments of this size including a new urban centre	Urban areas; large scale landscapes with lack of history/ time depth or that have been previously been altered; areas with less of a rural or wild character.	- Avoid areas with greater time depth such as undeveloped marshes, pre 18th century fields, and medieval field systems or common land. - Ensure open spaces within developments reflect the underlying landscape character by using locally occurring species and linking to the wider landscape. - Aim to provide enhanced management of existing landscape features, habitats and historic assets as part of any development, including contributing to Biodiversity Action Plan and guidelines in the Thurrock Landscape Character Assessment. - Incorporate Green Infrastructure into any new development or

¹⁰ The meaning of sensitivity in this context is the extent to which the character and quality of the landscape is susceptible to change as a result of development.

Development Scenario	Potential impacts on landscape character	Indication of areas with lower sensitivity	Guidance on minimising harm
	and buildings up to 4 storeys would be a notable new settlement in the landscape. This could alter the scale of smaller scale or intimate landscapes and the character of rural landscapes.		redevelopment to ensure no overall loss of ecosystem services. NB Thurrock's Design Strategy SPD provides more information about designing in context and achieving good design.
Substantial Housing Area 300 to 499 dwellings (11 to 33 Ha)	This type of development may result in direct loss of landscape features, increase the perceived human influence on the landscape and reduce the rural character of the landscape ('suburbanisation' of the landscape). It is likely to have a larger impact than the small housing area or infill development, but not as great an impact as the large and very large housing schemes. Due to its size it may appear out of scale with smaller scale or intimate landscapes.	Urban areas; large scale landscapes with lack of history/ time depth or that have been previously been altered; areas with less of a rural or wild character.	
Small Housing Area 75 to 299 dwellings (2.5 to 11Ha)	This type of development may result in direct loss of landscape features, increase the perceived human influence on the landscape and reduce the rural character of the landscape ('suburbanisation' of the landscape). It is likely to have a larger impact than the infill housing development, but not as great as the larger	Urban areas; brownfield sites or previously disturbed areas; landscapes with some sense of enclosure provided by vegetation; areas with less of a naturalistic or 'wild' character.	

Development Scenario	Potential impacts on landscape character	Indication of areas with lower sensitivity	Guidance on minimising harm
	housing schemes.		
Minor Housing, under 75 dwellings (or under 2.5 ha)	This type of development may result in some direct loss of landscape features and change the density and character of urban areas.	Urban areas; brownfield sites or previously disturbed areas; landscapes with some sense of enclosure provided by vegetation; areas with less of a naturalistic or 'wild' character.	In addition to the above guidance for larger housing sites, ensure any infill developments respect the scale of their context and enhance local visual amenity.
Flats	The main characteristic of this development that sets it aside from the developments above is its height: up to 10 storeys. Development of this type may be particularly visible in the landscape and indicative of an 'urban' situation – resulting in potentially adverse effects on landscapes that are rural in character.	Urban areas; areas with existing tall buildings or high bunds/ landforms that could provide shelter/screening for up to 10 storeys.	• Focus this type of development in urban areas where the scale of building will not dominate or overshadow existing developments. • Consider ways in which taller developments could provide a positive role in creating new nodes or landmarks, to aid navigation and urban structure. • Consider providing enhanced management of landscape features, habitats and historic assets as part of any development, including contributing to Biodiversity Action Plan and guidelines in the Thurrock Landscape Character Assessment. • Incorporate Green Infrastructure into any new development or redevelopment to ensure no overall loss of ecosystem services. NB Thurrock's Design Strategy SPD provides more information about designing in context and achieving good design.
Tall structures	Tall structures that are taller than a typical port warehouse height of 23m (e.g. large silos, tall office buildings, power station stacks) will be particularly prominent in the Thurrock landscape and could adversely affect skylines and scenic quality.	Developed areas; areas with existing tall structures or where a tall structure would not adversely affect existing landmarks.	• Avoid locating tall structures where they would intrude into currently undeveloped or 'pristine' views. • Focus this type of development in more urbanised rather than naturalistic or undeveloped areas. • Avoid lighting structures as far as possible to reduce their impact at night – consider infra-red lighting where possible. • Consider providing enhanced management of landscape features, habitats and historic assets as part of any development, including contributing to Biodiversity Action Plan and guidelines in the Thurrock Landscape Character Assessment

Development Scenario	Potential impacts on landscape character	Indication of areas with lower sensitivity	Guidance on minimising harm
Major Warehouse / Industry	Very large and bulky buildings (above 50,000 cubic metres) can result in direct loss of landscape features as well as introducing very bulky structures into the landscape, blocking views, increasing industrial character, and altering landscape scale and texture. The scale of the features may be particularly apparent when viewed from above or from elevated locations. The vehicle movements, ancillary activities/storage, and flood lighting associated with these developments can also adversely affect the character of rural landscapes and increase lighting at night.	Urban areas and brownfield sites; large scale landscapes; landscapes with some sense of enclosure or visual screening; not overlooked; areas with existing levels of activity.	• Aim to locate in large scale landscapes with an existing urban character and presence of existing visual screening, and that are not overlooked. • Avoid locating in very open and naturalistic/ undeveloped landscapes, or historic small scale landscapes. • Avoid locating this type of development where it would intrude into currently undeveloped or pristine views, or block notable or important views that contribute to Thurrock's amenity (such as the strategic views recorded in the Green Infrastructure Strategy). • Avoid lighting structures as far as possible and limit hours of lighting where possible to reduce their impact at night. • Consider use of receding colours to reduce the huge expanse of walls, and to help blend the buildings with their context. • Consider use of curved and green roofs to reduce the visibility of these large structures. • Ensure open spaces around the buildings reflect the underlying landscape character by using locally occurring species and linking to the wider landscape. • Minimise the use of security lighting – aim to use passive infra-red (PIR) technology where possible and ensure that any visible lighting is designed and installed in a manner which minimises glare or light spill into the surrounding landscape. • Consider providing enhanced management of landscape features, habitats and historic assets as part of any development, including contributing to Biodiversity Action Plan and guidelines in the Thurrock Landscape Character Assessment. • Incorporate Green Infrastructure into any new development or redevelopment to ensure no overall loss of ecosystem services.
Solar Farms above 5ha	Solar panels, en-masse, change the land use and appearance of a field or fields, affecting land cover patterns and the character of rural landscapes. On a sunny day they can appear blue while on a cloudy day they can appear a	Brownfield sites; areas of non-native vegetation; arable fields; flat areas with a sense of enclosure/ visual screening; areas with little time depth.	Site solar PV development on lower slopes/within folds in gently undulating lowland landscapes or on flat plateau sites rather than on slopes, especially higher slopes and skylines; • Site development in landscapes with a sense of enclosure (e.g. provided by woodland or high hedges) rather than in open and unenclosed landscapes. • Avoid older field patterns such as medieval field patterns and commons. • Site away from areas valued for their remoteness, areas free from human influence and perceived 'untamed' naturalness

Development Scenario	Potential impacts on landscape character	Indication of areas with lower sensitivity	Guidance on minimising harm
	dark grey, both of which contrast with surrounding green areas. These types of development may be particularly visible in open landscapes, particularly on upper slopes of hillsides, or where overlooked. The panels, as well as inverter buildings and security fencing can increase the perceived human influence on the landscape and erode the intrinsically rural character – the height of racks (up to 3m) means that they may overtop typical hedgerow/ hedge bank field boundaries. Construction of larger schemes may result in damage to landscape features such as hedgerow field boundaries and alter landscape scale.		• e.g. undeveloped marsh. • Ensure the area of development is in scale with the landscape in which it lies – it is likely that areas with smaller scale fields will accommodate smaller developments. • Minimising the number of adjacent fields that are developed to preserve legibility of field patterns. • Retain and protect trees and hedgerows and plant additional locally occurring species to enhance screening • Minimise height of panels so that they will be as unobtrusive as possible in the. Landform modelling (less than 2m high) could be considered but should be in keeping with landscape character. • Maintain land uses on the site that fit with the character of the area and manage vegetation under the solar panels to avoid the site becoming overgrown e.g. by grazing • Avoid dominating character in a local area –maintain a diversity of land cover types in anyone area. • Minimise the use of security lighting – aim to use passive infra-red (PIR) technology where possible and ensure that any visible lighting is designed and installed in a manner which minimises glare or light spill into the surrounding landscape. • Consider providing enhanced management of landscape • features, habitats and historic assets as part of any • development, including contributing to Biodiversity Action Plan and guidelines in the Thurrock Landscape Character Assessment. • Incorporate Green Infrastructure into any proposal to ensure no overall loss of ecosystem services.
Commercial Wind Turbines over 30m	Construction may result in direct loss of landscape features, including hedgerows. Their presence may increase the influence of built development on the landscape and may be perceived as out of scale in relation to human scale features in the landscape.	Large scale landscapes with few human scale features; brownfield sites; areas lacking important existing landmark features; areas with human activity and	• Select sites in simple, regular landscapes with extensive areas of consistent ground cover over landscapes with more complex land cover patterns, smaller field sizes and landscapes with frequent human scale features. • Seek to avoid areas valued for their remoteness, and perceived 'untamed' naturalness e.g. the undeveloped marshes. • Seek to avoid areas where ground level disturbance affects landscapes that are difficult to restore (e.g. marshland). • Consider locations in association with business parks and reclaimed, industrial and man-made landscapes where other landscape sensitivities are

Development Scenario	Potential impacts on landscape character	Indication of areas with lower sensitivity	Guidance on minimising harm
	Turbines on skylines may compete with existing landmark features for prominence where prominent undeveloped skylines or landmark features are characteristic of the landscape (particularly larger scale turbines). Ancillary buildings and security requirements (such as fencing) associated with wind energy schemes may introduce new features into the landscape. Lighting of turbines (for aviation safety) may introduce a source of light that would affect local amenity or darker landscapes at night.	development.	not compromised. - Consider the landscape effects of transmission infrastructure when siting development, aiming for sites that will minimise the need for above ground transmission infrastructure. Undergrounding cables may mitigate effects in sensitive locations. - Consider sites where areas of existing vegetation could screen ground-level features of wind energy developments (such as fencing, tracks and transformers). - Ensure turbines do not prevent the understanding and appreciation of historic landmarks features. - Consider siting turbines so they are perceived as part of other built development/ in association with a building group where effects on amenity allow. - When developing multiple turbines, ensure that turbines read as a coherent group in all the main views – aim for a composition that is visually balanced, simple and consistent in image as it is viewed from various directions. - In urban fringe or industrial contexts, developments should respond to the scale of the built form and sit comfortably alongside buildings or structures. - Ensure that the proportion of rotor diameter to tower height is balanced - short blades on a tall tower or long blades on a short tower may look unbalanced. Aim for a ratio of approximately 1:1 for tower height: blade diameter. - Simple, pale grey coloured turbines will be most suitable (to reduce contrast with the sky and match existing turbines). - Minimise the width and length of new tracks introduced into the landscape, using existing routes wherever possible. - Ancillary features should match the local vernacular where they are visible (e.g. using locally occurring materials on substations, control buildings, and transformer cabins if not housed within the turbines). - If lighting is required on turbines for aviation purposes, use infra-red lighting to minimise visual effects at night, particularly in darker areas. Consider providing enhanced management of landscape features, habitats and historic assets as part of any development, including contributing to Biodiversity Action Plan and guidelines in the Thurrock Landscape Character Assessment.
Open storage	Large scale vehicle open storage could result in loss of	Brownfield sites; areas of non-native	- Aim to locate on brownfield sites in large scale landscapes with presence of existing visual screening, and that are not overlooked. - Avoid locating in very open and naturalistic/ undeveloped landscapes, or

Development Scenario	Potential impacts on landscape character	Indication of areas with lower sensitivity	Guidance on minimising harm
	landscape features as well as changing the land use (particularly of rural areas). This type of development may be particularly visible in open landscapes, or where overlooked. On a sunny day reflected light from vehicles can enhance visibility. The presence of vehicles and ancillary features such as security fencing increase the perceived human influence on the landscape. Although there is no flood lighting security lighting could affect dark landscapes at night.	vegetation; flat areas with a sense of enclosure/ visual screening; areas with little time depth; areas that are not overlooked.	historic small scale landscapes (including medieval field patterns and commons). • Ensure the area of development is in scale with the landscape in which it lies. • Avoid locating this type of development where it would intrude into currently undeveloped or pristine views, or important views that contribute to Thurrock's amenity (such as the strategic views recorded in the Green Infrastructure Strategy). • Retain and protect trees and hedgerows and maximise use of planting to screen sites and enhance local character and biodiversity by using locally occurring species that are characteristic of the wider landscape. • Minimise the use of security lighting – aim to use passive infra-red (PIR) technology where possible and ensure that any visible lighting is designed and installed in a manner which minimises glare or light spill into the surrounding landscape. • Incorporate Green Infrastructure into any proposal to ensure no overall loss of ecosystem services. • Consider providing enhanced management of landscape features, habitats and historic assets as part of any development, including contributing to Biodiversity Action Plan and guidelines in the Thurrock Landscape Character Assessment.
Lorry Parks	Development of a lorry park could result in direct loss of landscape features as well as affect the character of more rural or undeveloped areas. This type of development may be particularly visible in open landscapes, or where overlooked. On a sunny day reflected light from vehicles can enhance visibility. The activity arising from the continual movement of vehicles will increase the perceived human influence on the landscape could	Brownfield sites; flat areas with a sense of enclosure/ visual screening; areas with little time depth; areas that are not overlooked; active areas and areas already affected by lighting at night.	• Aim to locate on brownfield sites in large scale landscapes with presence of existing visual screening, and that are not overlooked. • Avoid locating in very open and naturalistic/ undeveloped landscapes, or still and dark landscapes. • Avoid siting in historic small scale landscapes (including in areas of medieval field patterns and commons). • Ensure the area of development is in scale with the landscape in which it lies. • Avoid locating this type of development where it would intrude into currently undeveloped or pristine views, or important views that contribute to Thurrock's amenity (such as the strategic views recorded in the Green Infrastructure Strategy). • Retain and protect trees and hedgerows and maximise use of planting to screen sites and enhance local character and biodiversity by using locally occurring species that are characteristic of the wider landscape. • Minimise the use of lighting and ensure that any visible lighting is designed and installed in a manner which minimises glare or light spill into the surrounding landscape. Aim to use passive infra-red (PIR) technology where

Development Scenario	Potential impacts on landscape character	Indication of areas with lower sensitivity	Guidance on minimising harm
	adversely affect 'still' or tranquil landscapes. The flood lighting associated with these developments would adversely affect intrinsically dark landscapes.		possible. • Incorporate Green Infrastructure into any proposal to ensure no overall loss of ecosystem services. • Consider providing enhanced management of landscape features, habitats and historic assets as part of any development, including contributing to Biodiversity Action Plan and guidelines in the Thurrock Landscape Character Assessment.
Minerals and waste sites	Mineral extracting sites and landfill sites both involve permanent changes to the ground. Extraction can result in large changes while the site is operation, resulting in direct loss of landscape features and changes to landform (excavation as well as bunds which can block existing views) and introducing activity into the landscape, but the restoration phase does provide an opportunity to restore, and even enhance, the existing site. The creation of landfill sites also result in ground disturbance which can also result in direct loss of landscape features as well as changing the natural profiles of the landscape. Activity associated with the site will also affect the sense of tranquillity.	Areas lacking distinct landform features; areas where land has been disturbed or adapted by farming legacy; area with a sense of enclosure that can provide natural screening; areas with existing human activity; area with little time depth; areas that are not visually prominent; areas that provide opportunities for enhancement post-mineral extraction	• Avoid areas with distinctive landform features that could be lost or altered; • Use existing vegetation and landform to provide natural screening, and consider additional planting that is in character with the local landscape to ensure operations are well screened; • Avoid areas with great time depth (e.g. medieval fields, areas of common land) or naturalistic and cover; • Avoid areas that are visually prominent such as slopes that form a backdrop to views; • Aim to restore sites to natural profiles and minimise the formation of unnatural landforms. • Aim to get the maximum benefit from restoration proposals (including opportunities for development where appropriate). Aim to replicate, if not improve, what's there already. • Consider views from adjacent landscapes when planning any development. • Any site should be in scale with the landscape in which it is located – aim to protect the landscape structure, such as hedgerow patterns. • Protect characteristic landscape features such as hedgerows, trees, woodlands, and semi-natural or unimproved grassland sites and aim to extend these as part of any development or restoration scheme. • Aim to locate developments in areas already affected by human activity where possible. • Consider providing enhanced management of landscape features, habitats and historic assets as part of any development, including contributing to Biodiversity Action Plan and guidelines in the Thurrock Landscape Character Area Profiles. •

NB The indications of areas with lower sensitivity provide an initial indication only. All applications for development will need to be assessed on their individual merits through the planning process.

Part 2: The Landscape Character of Thurrock



5 Classifications

- 5.1 As explained in the method, the classification has been undertaken at both a strategic and local scale.

Strategic Scale

- 5.2 The intention of the strategic scale classification is to show how the different types of landscape flow under the urban areas and cross boundaries into adjacent administrative areas. This scale of assessment will be useful to understand how different areas are linked by their underlying common characteristics.
- 5.3 **Figure 5.1 – Strategic Landscape Character Types and Areas** shows the broad scale classification and **Table 5.1** presents the classification.

Table 5.1: Strategic Scale Classification

Strategic Scale Type and Area	Description	Boundaries and relationship to other classifications
River Valley Catchment: Mar Dyke River Valley Catchment	This area is defined by the catchment of the Mar Dyke river which flows from north to south across gently sloping land to the Thames at Purfleet. The area is low lying, mostly less than 10m above sea level. The catchment continues north-west outside of the borough into Havering and Brentwood districts. The Mar Dyke lies within an area known as the Bulphan basin in the north of the area, marked by a fan of alluvium overlying clay geology that supports a cultivated landscape of former fenland. A well-wooded ridge running between Romford and Basildon¹¹ provides a subtle but distinctive horizon in views from low lying land to the south. In the south-west of the area the Mar Dyke passes between urban areas and has distinctive wooded sides. At a strategic scale, the Thames Chase Project¹² covers half of this area, continuing west into the landscape surrounding the London/Essex border.	- Combination of 'Fenland Landscape' (type A) and 'Urban Fringe Landscape' (areas D2 and D3) in previous Thurrock Capacity Study. - Expanded area of the East of England Typology 'Valley Meadowlands' to incorporate the lower Mar Dyke valley further to the south and the fenland further east. - Adjoins the Fenland character area in Brentwood. - Strong correlation with topography (approximately 0-10m) and the alluvium and clay geology.
Wooded and Farmed River Terrace Gravels: Aveley and South Ockendon Wooded and Farmed River Terrace	The character of this area is influenced by the underlying river terrace gravels which have given rise to relatively low fertility soils and areas rich in minerals. The land cover consists of woodlands in the north-west of the area that extend outside of the borough into Havering, forming part of the Belhus Woods Country Park; extensive areas of mineral workings of predominantly sand and gravel; and the two largely post-war urban expansion settlements of Aveley and South	- Combination of 'Rolling Farmland/ Wooded Hills Landscape' (type B) and 'Urban Fringe Landscape' (type D) in the previous Thurrock Capacity Study. - Strong correlation with 'Wooded Farmlands' in East of England Typology. - Strong relationship with the (lower) Mar Dyke to the south.

¹¹ ('Wooded Farmland' (Type F) within Brentwood District, 'Wooded Hills and Ridges' (Type L) within Basildon District and the 'Higher Farmland and Woods' (Strategic Type) within Thurrock.

¹² The Thames Chase Community Forest is a landscape regeneration initiative of woodland planting within countryside areas situated in Barking and Dagenham, Brentwood, Havering and Thurrock

Strategic Scale Type and Area	Description	Boundaries and relationship to other classifications
Gravels.	Ockendon between which lies the historic parkland of Belhus Park. This is against a backdrop of agricultural fields used for rough grazing, cereals and horticultural crops. At a strategic scale, the Thames Chase Project covers half of this area, continuing west into the landscape surrounding the London/Essex border.	
Low Chalk Ridge: Grays Conurbation Low Chalk Ridge.	This area is defined by the band of chalk upon which the settlements of Purfleet, West Thurrock, Lakeside, Chafford Hundred, South Stifford and Grays have developed and merged together to form one large urban area. The band of chalk forms a low ridge above the adjoining marshland to the south and the Mar Dyke river valley to the north, and has been extensively quarried, leaving distinctive chalk pits and exposed chalk faces. To the east the geology transitions to clay, giving rise to the farmland character of the Orsett to Chadwell farmland.	- Correlation with the 'Urban' type (areas E3 and E4) in previous Thurrock Capacity Study, with the exception of the Chadwell St Mary and Tilbury areas. - Urban type in the East of England Typology. - Boundaries are defined by the chalk geology, although the eastern boundary is more transitional as a result of the gradual change in character to a more rural and agricultural landscape.
Marshland: Thurrock Marshland.	The Thurrock Marshland consists of the areas of marsh on the northern bank of the River Thames that form part of an important sequence of marshes on both sides of the river, continuing outside of the borough to the east, west and south. The level and expansive coastal grazing marsh landscapes within Thurrock stamp their identity on the Borough. These extensive open spaces have a wild and windswept character that is accentuated by broad expanses of sky. The marshland grasses create a constantly moving and changing tapestry of vegetation the character of which is influenced by the seasons and daily by light. Although marred by landfill sites and the clutter of pylons and power lines, the marshlands have an air of ancient permanence that contrasts sharply with the ever-changing urban forms adjacent to them. Of all the different landscapes within the borough the intrinsic character of the undeveloped marshland landscapes has remained essentially unchanged for centuries. The topography is a strongly defining feature of the marshland areas, including low lying land generally no more than 5m AOD above sea level. The alluvium geology often provides a rare and important habitat for a rich biodiversity, often sitting in proximity to large scale industrial land uses that have developed to take advantage of the strategic riverside situation.	- Correlation with 'Marsh Landscape' (type C) in the previous Thurrock Capacity Study, including some small areas of 'Urban' and 'Urban Fringe'. 'Thames Gateway' broad character area in the Landscape Assessment of Kent. - Combination of 'Coastal Levels', 'Urban' and 'Saltmarsh/Intertidal Flats' in the East of England Study. - Defined by the strong correlation with alluvium geology and <5m AOD topography. - Adjoins Bowers and Vange Estuary Marshland in Basildon and shares similar characteristics with riverside and marshland landscapes on the south side of the Thames.
Undulating Farmland: Orsett to Chadwell Undulating Farmland.	This area is defined by the gently undulating topography that lies between the marshes to the south and east, the Mar Dyke river catchment to the west and the slopes beneath the Langdon Hills to the north. The predominant geology of clay and sand underlying deposits of sands and gravels marks a localised area of productive sandy brown soils of 'very good' agricultural quality, resulting in much of the land being under arable cultivation.	- Amalgamation of the eastern section of 'Urban Fringe Landscape' (type D), and smaller parts of 'Urban' and 'Rolling Farmland/ Wooded Hills Landscape' (type B) in the previous Thurrock Capacity Study. - Correlation with the 'Lowland Settled Estate Farmlands' type in the East of England Typology, including a small section of

Strategic Scale Type and Area	Description	Boundaries and relationship to other classifications
	The core of the area is semi-rural in character, with a settlement pattern of scattered farms, small villages and towns. Urban influences increase to the east and west of the area, with the largest settlement being Stanford-le-Hope/Corringham in the east of the area.	'Lowland Settled Claylands'
Higher Farmland and Woods: Langdon Hills and Ridges Higher Farmland and Woods.	This area is defined by the rising topography in the north-east of the borough, which becomes steeper towards the borough boundary, forming the highest point in the borough at Langdon Hills. The hills continue beyond the borough boundary into Basildon district, as part of Langdon Hills Country Park. These form part of the wooded hills and ridges in Basildon, Brentwood and Havering districts stretching north-west as far as Romford¹³. The lower slopes are characterised by agricultural fields often with historic field patterns on the gentler slopes underlain by London clay.	• Broad correlation with 'Rolling Farmland/Wooded Hills Landscape' (type B- areas B2 and B3) in the previous Thurrock Capacity Study. • Combination of 'Wooded Hills and Ridges' and 'Lowland Settled Claylands- (soft rock lowlands physiography)' from East of England Typology. • Boundaries defined by the topography, from where the slopes begin to rise (slopes rising from 20-115m). • Adjoins Langdon Hill in Basildon.
Strategic River Corridor: River Thames Strategic River Corridor.	This area is defined by the river up to (approximately) the high water mark. The Thames forms a distinctive 'riverscape' along the southern edge of the Borough, as part of the wider 'Greater Thames Estuary' National Character Area 81 and the 'Thames Gateway' defined in the South Essex Green grid Strategy. In the west near Aveley Marshes the Thames is narrower, widening towards Holehaven Creek in the east. The banks of the river are penetrated by large creeks, smaller inlets and bays. Numerous jetties, wharfs and piers punctuate the northern bank, which is heavily industrialised for most of its length between Aveley Marshes and Tilbury, and again around Holehaven Creek. The presence of industry creates a dramatic and changing riverscape of angular machinery and buildings with dock activity and some new major urban and leisure developments, river traffic and changing light reflected on the constantly moving water of the Thames. This contrasts with the adjacent open and low-lying marshes. Settlement has sprawled along the north bank of the river.	• The River Thames within Thurrock, up to (approximately) the high water mark. • Locally influenced by the riverside character of the adjacent character areas. • Part of the wider 'Greater Thames Estuary' National Character Area 81/ the Inner South East Marine Plan Area.

Local Scale

- 5.4 The local scale classification is typical of a District classification undertaken at 1:25,000 scale. This scale of assessment is the focus of the District study and describes how character varies across the District. The main descriptive and evaluative information is presented at this scale.
- 5.5 **Figure 5.2 – Local Landscape Character Types and Areas** shows the local scale classification and **Table 5.1** presents the classification. **Figure 5.3** shows how the Types and Areas relate to those in the

¹³ Including 'Wooded Farmland' (Type F) within Brentwood District and 'Wooded Hills and Ridges' (Type L) within Basildon District.

neighbouring districts. The colours indicate the strategic character area that each sub-area belongs to. Each section of the report is colour coded according to these colours.

- 5.6 'Local Variations' in landscape character are identified within each LandscapeCharacter Profile.

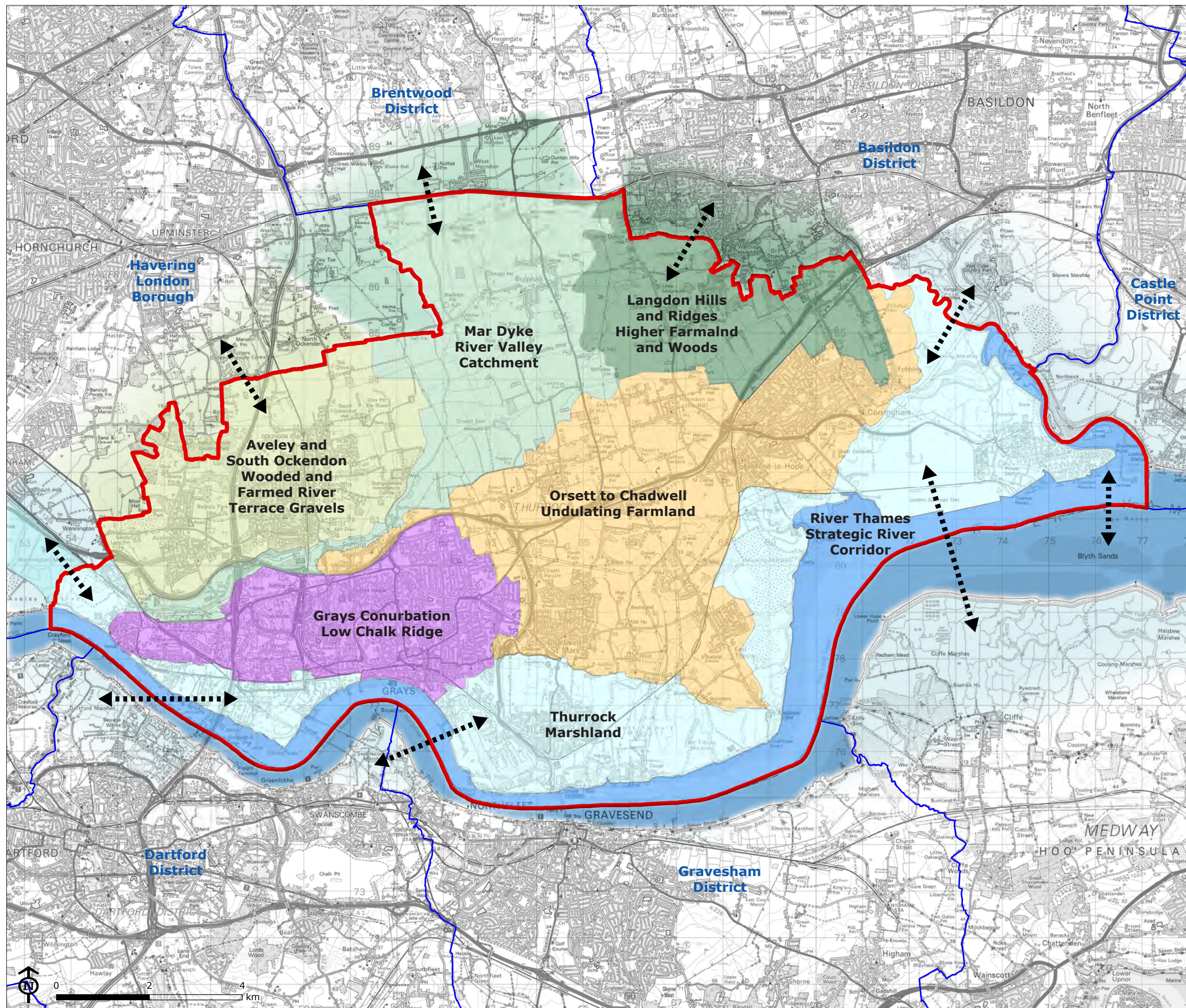
Table 5.2: Local Scale Classification

Local Scale Type	Local Scale Area
Mar Dyke River Valley Catchment Strategic Area	
A Fenland	A1 Bulphan Fenland
B River Valley	B1 Lower Mar Dyke River Valley
Aveley & South Ockendon Wooded & Farmed River Terrace Gravels Strategic Area	
C Farmed River Terrace Gravels	C1 Belhus Farmed River Terrace Gravels
D Towns on River Terrace Gravels	D1 Aveley
	D2 South Ockendon
Grays Conurbation Low Chalk Ridge Strategic Area	
E Settled Chalk Ridge	E1 West Thurrock, Lakeside & Purfleet
	E2 Grays, Chafford Hundred & South Stifford
Thurrock Marshland Strategic Area	
F Undeveloped Marsh	F1 Aveley Marshes
	F2 Tilbury Marshes
	F3 Mucking Marshes
	F4 Fobbing Marshes & Haven Creek
G Developed Marsh	G1 West Thurrock Marshes
	G2 Tilbury Docks
	G3 Tilbury
	G4 London Gateway Port
Orsett-Chadwell Undulating Farmland Strategic Area	
H Open Undulating Farmland	H1 East & West Tilbury Open Undulating Farmland
	H2 Orsett & Horndon on the Hill Open Undulating Farmland
	H3 Fobbing Ridge Open Undulating Farmland
I Towns on Farmland	I1 Chadwell St Mary
	I2 Stanford-le-Hope & Corringham
Langdon Hills Strategic Area	
J Lower Hill Slopes	J1: Langdon Lower Hill Slopes
K Higher Hills	K1: Langdon Higher Hills
River Thames Strategic Corridor Strategic Area	
L Local River Reaches	L1: Long Reach to North fleet Hope
	L2: Gravesend Reach to Sea Reach

The Status, Meaning and Limitations of Boundary Lines

- 5.7 The precision of boundaries drawn around landscape character areas and types varies with the scale and level of detail of the assessment. This assessment has been mapped at a scale of 1:25,000 which means that it is suitable for use at this scale. The scale of this classification will need to be taken into account whenever the assessment is used to ensure that the level of detail is compatible with the intended application.

- 5.8 In reality landscape character does not change abruptly at the boundaries. Boundaries therefore often represent transitions rather than marked changes on the ground.



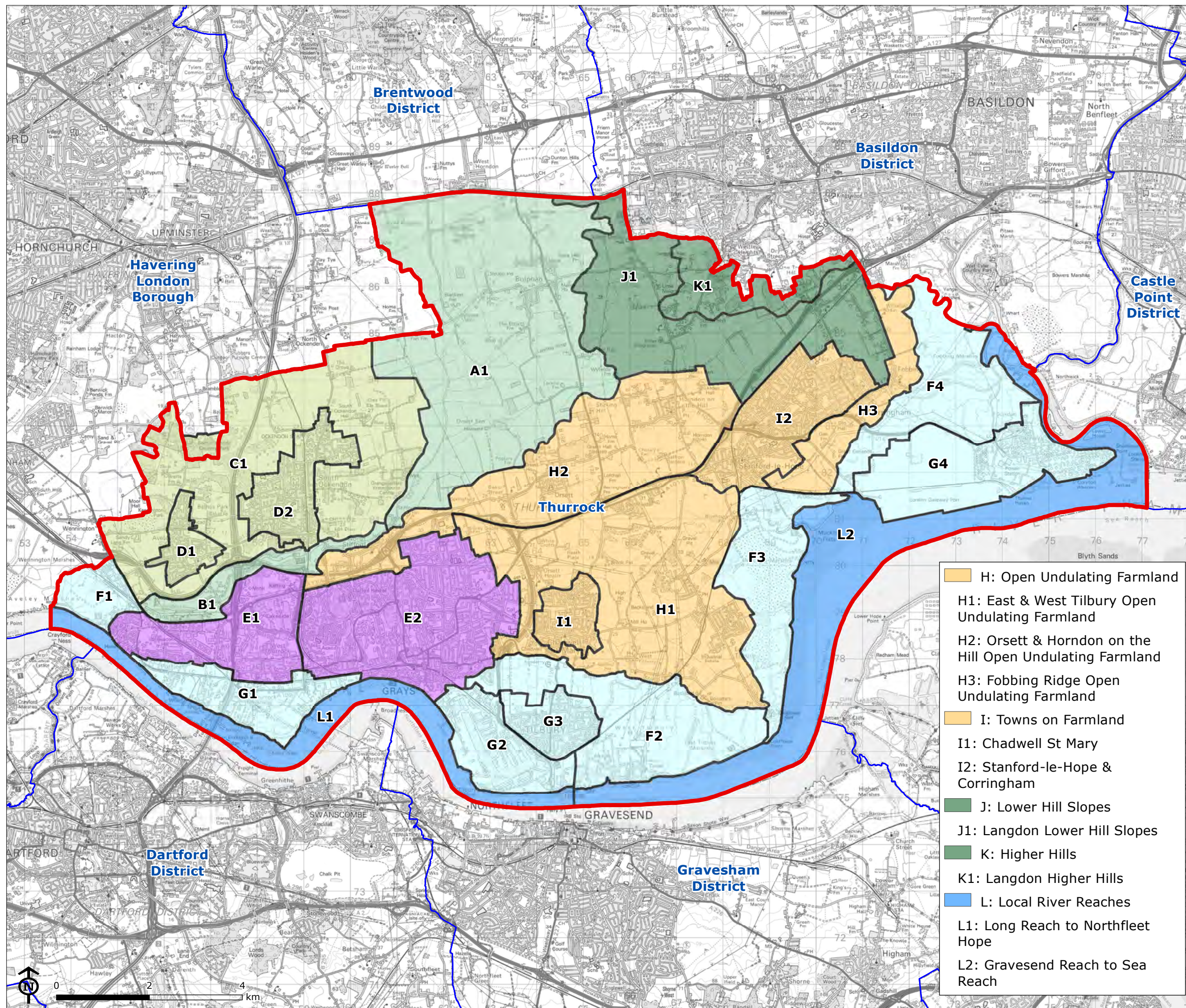
Thurrock Landscape Character Assessment

Figure 5.1: Strategic Landscape Character Types & Areas

- Study Area
- Local Authority boundary
- Strategic Landscape Character Type**
 - Higher Farmland and Woods
 - Low Chalk Ridge
 - Marshland
 - River Valley Catchment
 - Strategic River Corridor
 - Undulating Farmland
 - Wooded and Farmed River Terrace Gravels
- Continuation of Character

Map Scale @ A3: 1:80,000





Thurrock Landscape Character Assessment

Figure 5.2: Local Landscape Character Types & Areas

- ▬ Study Area
- ▬ Local Authority boundary

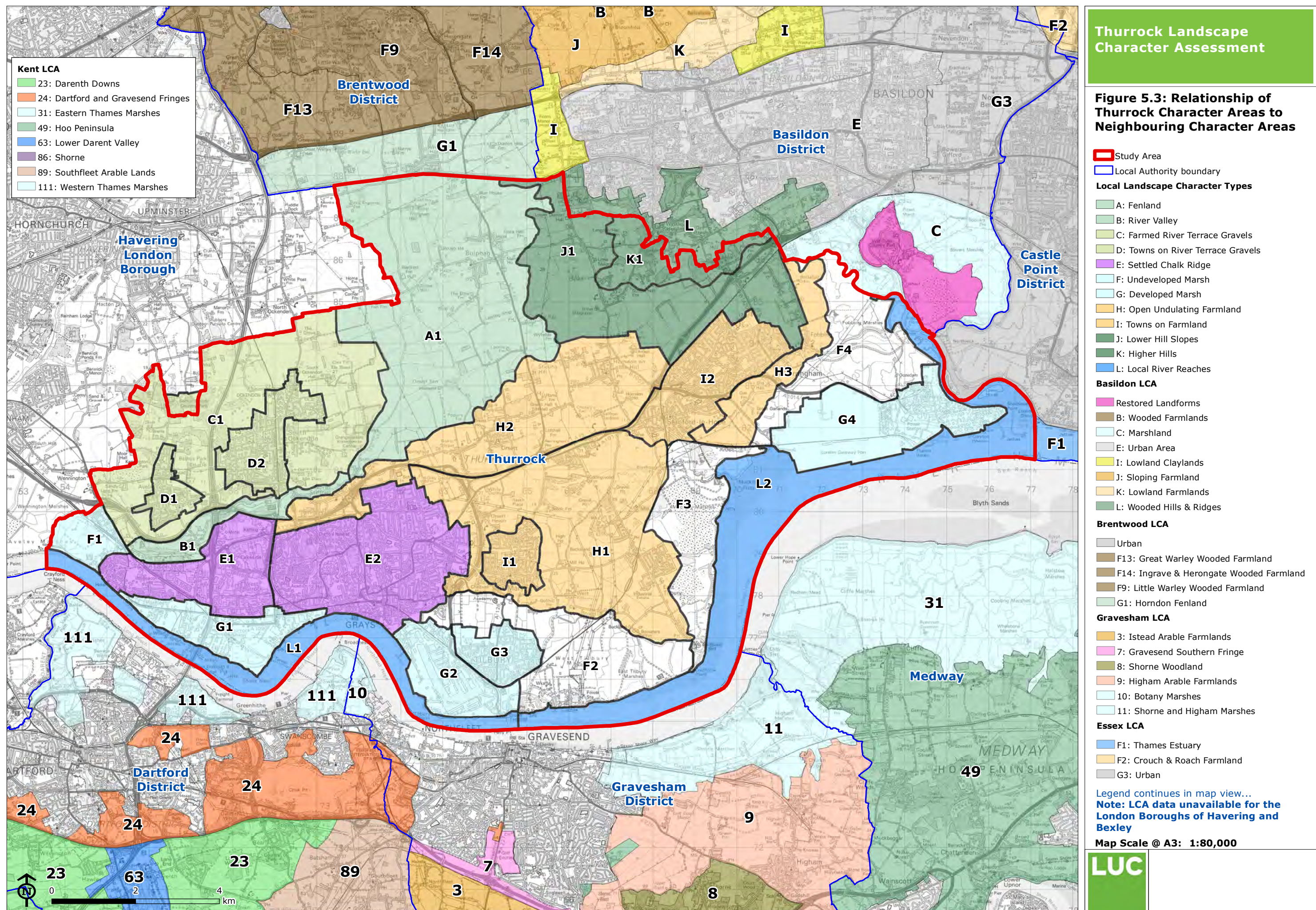
Local Landscape Character Types & Areas

- A: Fenland
 - A1: Bulphan Fenland
- B: River Valley
 - B1: Lower Mar Dyke River Valley
- C: Farmed River Terrace Gravels
 - C1: Belhus Farmed River Terrace Gravels
- D: Towns on River Terrace Gravels
 - D1: Aveley
 - D2: South Ockendon
- E: Settled Chalk Ridge
 - E1: West Thurrock, Lakeside & Purfleet
 - E2: Grays, Chafford Hundred & South Stifford
- F: Undeveloped Marsh
 - F1: Aveley Marshes
 - F2: Tilbury Marshes
 - F3: Mucking Marshes
 - F4: Fobbing Marshes & Haven Creek
- G: Developed Marsh
 - G1: West Thurrock Marshes
 - G2: Tilbury Docks
 - G3: Tilbury
 - G4: London Gateway Port

- H: Open Undulating Farmland
 - H1: East & West Tilbury Open Undulating Farmland
 - H2: Orsett & Horndon on the Hill Open Undulating Farmland
 - H3: Fobbing Ridge Open Undulating Farmland
- I: Towns on Farmland
 - I1: Chadwell St Mary
 - I2: Stanford-le-Hope & Corringham
- J: Lower Hill Slopes
 - J1: Langdon Lower Hill Slopes
- K: Higher Hills
 - K1: Langdon Higher Hills
- L: Local River Reaches
 - L1: Long Reach to Northfleet Hope
 - L2: Gravesend Reach to Sea Reach

Map Scale @ A3: 1:80,000





Appendix 1: Glossary of Terms

Term	Definition
Aesthetic	Concerning the visual appeal of a feature or landscape
Amenity	The pleasantness or attractiveness of a place.
AOD	Above Ordnance Datum (sea level).
AONB	Area of Outstanding Natural Beauty – a statutory national landscape designation.
Agricultural Land Classification	The classification of agricultural land in England in Wales.
Ancient woodland	Woods that are believed to have been continuous woodland cover since at least 1600 AD.
Alluvium	Loose soil or sediments, which have been eroded, reshaped by water in some form, and redeposited in a non-marine setting.
Arable	The growing of crops.
Biodiversity	The measure of the variety of organisms present in different ecosystems.
Borrowdyke	A wide trench or depression left by digging out the soil to make a sea wall.
Built Form	The characteristic nature of built development.
Characteristic	A distinctive element of the landscape that contributes to landscape character for instance a particular hedgerow pattern or sense of tranquillity.
Condition	A judgement on the intactness and condition of the elements of the landscape.
Coniferous woodland	Woodland comprised of coniferous trees often having needle like leaves. They are usually evergreen.
Copse	A small group of trees
Creek	A narrow, sheltered waterway, especially an inlet in a shoreline or channel in a marsh.
Deciduous woodland	Woodland where the majority of tree lose their leaves at the end of the growing season
Dyke	A natural or artificial slope or wall to regulate water levels, or a water filled drainage trench

Term	Definition
Drift	The name for all material of glacial origin found anywhere on land or at sea, including sediment and large rocks.
Enclosure	The placing in private hands of land to which there was previously common rights; the merging of strip fields to form a block surrounded by hedges.
Fleet	A marshland creek.
Floodplain	The area that would naturally be affected by flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas.
Flood alleviation	The act of reducing flooding by various means
Forces for change	These are both positive and negative factors that are known to or have potential to act on the landscape, including agricultural management issues, policy and development pressures.
Garden City	The Garden City Movement originated in England with the theories of Ebenezer Howard, published in 1898, and given physical realisation in settlements such as Letchworth, Welwyn Garden City and Hampstead Garden Suburb. Garden Cities were intended to be planned self-contained new settlements surrounded by a landscaped setting with proportionate areas of residences, industry and agriculture.
Geodiversity	The variety of rocks, minerals, fossils, landforms, sediments and soils in an area, together with natural processes, such as erosion and landslips that may still be active.
GIS	Geographic Information System.
GPS	Global Positioning System.
Green Belt	An area of open land around a city, on which building is restricted.
Habitat	The natural home or environment of an animal, plant, or other organism.
Heathland	A shrubland habitat found mainly on free-draining infertile, acidic soils, characterised by open, low-growing woody vegetation.
HLC	Historic Landscape Characterisation.
HLT	Historic Landscape Type.
Horsiculture	Development of farmland for horses and equestrianism
Hydrology	The science dealing with the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere
Intactness	Not changed or diminished
Land cover	The physical material at the surface of the earth.

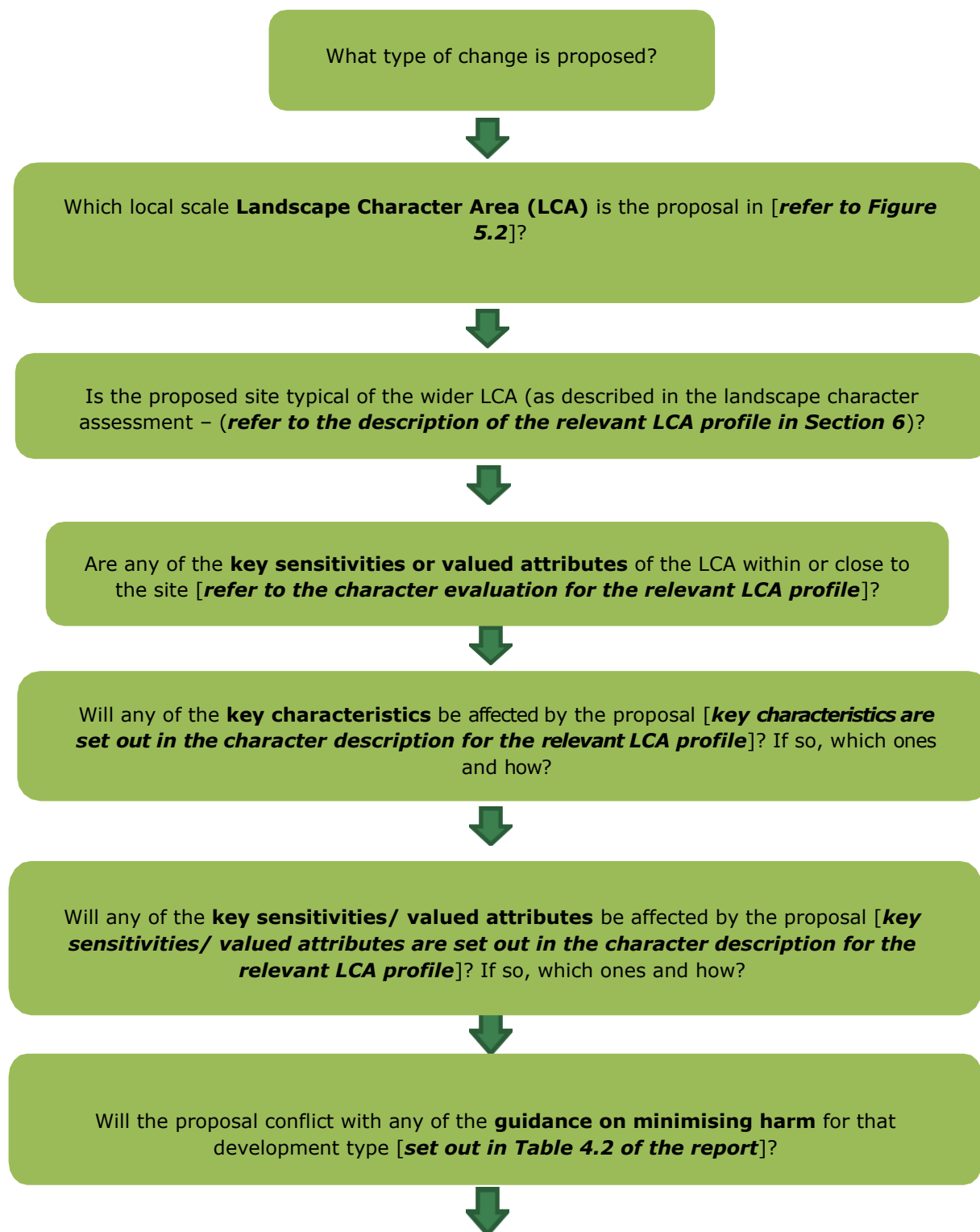
Term	Definition
Landscape character	The distinct, recognisable and consistent pattern of elements that occurs consistently in a particular landscape and how these are perceived. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement.
Landscape character areas(LCA)	Single unique areas that are the discrete geographical area of a particular landscape type.
Landscape character types (LCT)	Distinct types of landscape that is relatively homogenous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but share broadly similar combinations of geology, topography, drainage patterns, vegetation, historic land use and settlement pattern.
Landmark	An object or feature of a landscape or town that is easily seen and recognized from a distance, especially one that enables someone to establish their location (from the Oxford Dictionaries online: http://www.oxforddictionaries.com/definition/english/landmark)
Landscape Strategy	Principles to manage and direct landscape change for a particular landscape type or character area including identification of any particular management needs for specific elements.
Local Plan	A development plan prepared by local planning authorities.
Naturalness	The quality or state of being natural.
NCA	National Character Area – defined within the <i>National Character Area Study, Natural England (2013)</i> - NCAs divide England into 159 distinct natural areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity, history, and cultural and economic activity.
Nucleated Settlements	A settlement that is clustered around a centre, in comparison to a linear or dispersed settlement.
OS	Ordnance Survey.
Perceptual	The ability to interpret or become aware of something through the senses.
Permeability	The degree to which an area has a variety of pleasant, convenient and safe routes through it
Plotlands	Small pieces of land laid out in regular plots on which a number of self-built settlements were established in the south-east of England from the late 1800s and up to the Second World War. The Second World War and the planning regulations which followed brought an end to most new plotland development from being created.
Remnant	A part or quantity left after the greater part has been used, removed, or destroyed.
Rural	Relating to or characteristic of the countryside

Term	Definition
Scheduled Monument	Nationally important archaeological sites or historic buildings, given protection against unauthorised change
Sense of Place	A person's perception of a location's indigenous characteristics, based on the mix of uses, appearance and context that makes a place memorable.
Sensitive	The response to change or influence.
Settlement pattern	The shape of a settlement.
Skyline	The outline of a range of hills, ridge or group of buildings seen against the sky.
SSSI	Site of Special Scientific Interest.
Superficial deposits	Geological deposit from the Quaternary age may include stream channel and floodplain deposits. All pre quaternary deposits are known as bedrock.
Streetscape	The term used to describe the visual composition of a street, usually comprising building frontages, boundary treatments, spaces, views and vistas, landscaping, street furniture and materials.
Strength of character	A judgement on how distinctive and recognisable the pattern is that defines the character of the landscape. This includes the combination of physical and cultural attributes and the sense of place that they evoke.
Time depth	The time period expressed in the landscape, or the extent to which the landscape reflects a certain time period (a landscape with greater time depth will comprise older elements than a landscape with lesser time depth).
Topography	The arrangement of the natural and artificial physical features of an area.
Townscape	The character and composition of the built environment including the buildings and the relationships between them, the different types of urban open space, including green spaces, and the relationship between buildings and open spaces ¹⁷ .
Townscape character	The distinct, recognisable and consistent pattern of elements that occurs consistently in a particular urban area and how these are perceived. This reflects land use and urban morphology as well as the underlying landscape character.
Urban structure	The structure of the urban area/townscape as a whole, including legibility, focal points and landmarks, gateways and views and visual sequences.
Valued attributes	Positive features and characteristics that are important to landscape character and that, if lost, would result in adverse change to the landscape.

¹⁷ From GLVIA3

Appendix 2: User Guide

This User Guide is designed for both developers and decision-makers to help them consider landscape character when planning any type of change. The guide is arranged around a number of key stages, setting out a series of questions as prompts to assist in using available information to shape proposals / assist in planning decisions.



If the answer is yes to any of the last 3 questions can the scheme be altered in any way to avoid adverse effects on key characteristics, sensitivities or valued attributes, or landscape objectives?



If not, can adverse effects be reduced or offset? How?



How does the proposal contribute positively to the vision for the character area [***refer to the vision set out in the Character Evaluation in the LCA Profile***]?

Appendix 3: Bibliography and References

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