GREEN INFRASTRUCTURE & BIODIVERSITY STRATEGY

London Borough of Barking and Dagenham

London Borough of
Barking & Dagenham

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EXECUTIVE SUMMARY

Barking and Dagenham Council recognises the significance of green infrastructure and biodiversity to supporting the authority's strategic objective of delivering inclusive sustainable growth for the borough. The new Local Plan for Barking and Dagenham will be critical to the delivery of this aspiration. The Green Infrastructure and Biodiversity Strategy forms part of the evidence base for the Local Plan. The strategy analyses the significance of the various components of the natural environment at a local and sub-regional level and characteristics that are specific to Barking and Dagenham itself and provides a set of green infrastructure and biodiversity design principles that can support inclusive and sustainable growth across the borough.

Section 1 of the report defines green infrastructure and outlines the importance of green infrastructure and biodiversity for Barking and Dagenham. This analysis includes a consideration of the role of green infrastructure in defining a sense of 'place', an assessment of the importance of green infrastructure and biodiversity in delivering ecosystem services and the importance of integrating a consideration of green infrastructure and biodiversity stewardship into other strategic initiatives.

In **Section 2**, the proposed Green Infrastructure and Biodiversity Strategy is set in the context of the strategic planning context at national, regional and local level. The section also considers the strategy in the context of the council's over-arching strategic objectives. Consideration is given to local partnerships and initiatives that might influence how the strategy is rolled out across the borough.

A considerable body of work has been devoted to the development of best practice for green infrastructure and biodiversity and this is referenced in Section 3. This best practice work has been used as a point of reference for the Barking and Dagenham's Green Infrastructure and Biodiversity Strategy.

Section 4 proposes principle points of reference for a new green infrastructure strategy for Barking and Dagenham. These include 'Borough Places' identified in the Barking and Dagenham Townscape and Socioeconomic Characterisation Study and a number of local and sub-regional initiatives.. This section also references the landscape character areas identified for the borough in the 'London Natural Signatures' report for Natural England and assesses their influence over green infrastructure enhancement.

Barking and Dagenham has an extensive set of green infrastructure and biodiversity assets of different typologies. **Section 5** of the report describes each of these in turn and suggests the significance of each element to the development of a green infrastructure and biodiversity grid for the borough.

Section 6 of the report describes this grid in detail. By mapping individual green infrastructure typologies, an assessment is made of the potential principal green infrastructure grid connections across the borough. Grid connections are categorised as A and B routes with the former connecting major green infrastructure elements across the borough as a whole while the latter are of significance on a local level.

Green infrastructure grid connections are analysed at a local level in five sub-divisions of the borough – north, west, east ,central and south. In **Section 7**,

opportunities for green infrastructure enhancements along grid routes are identified and detailed. Where grid connectivities are missing or difficult to establish (e.g. where they are interrupted by major transport corridors), options to enhance connectivity are proposed.

Section 8 sets out the design principles for green infrastructure for the borough, including soft landscaping on new developments, and provides design codes for each of the character areas defined in the Townscape and Socioeconomic Characterisation Study. This will help ensure the delivery of green infrastructure that is high quality, multi-functional and appropriate to its location.

For the Green Infrastructure and Biodiversity strategy to be effective, a robust delivery mechanism needs to be implemented to ensure that identified projects and programmes are progressed and funded, cross-departmental and partnership working is effective in delivering the strategy's objectives, and the delivery of the strategy itself is robustly monitored. **Section 9** of the report proposes a series of delivery mechanisms that will underpin future success.

Figure 1 - Beam Parklands

1.1 WHY IS GREEN INFRASTRUCTURE AND BIODIVERSITY IMPORTANT FOR BARKING AND DAGENHAM

Green Infrastructure is a network of natural and man-made features such as parks, open spaces, nature reserves, woodlands, meadows, paths and waterways that link the different areas of Barking and Dagenham together and help to define the different places that characterise the borough.

Green infrastructure is 'a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities'[1] and provides a range of 'ecosystem services' that are vital in supporting the quality of life for the current and future residents of the borough. Ecosystem services include clean air, clean water, growing media for food and for plants, and biodiversity. The Green Infrastructure approach proposes that each unit of land management (including those occupied by buildings) can generate ecosystem services and that these can operate at a variety of levels – neighbourhoods, districts, cities and regions.

But importantly, Green Infrastructure also delivers a range of positive economic, social and environmental benefits that enhance quality of life and socio-economic cohesion. Good quality green infrastructure enhances the economy of Barking and Dagenham by promoting the success of town centres and sustainable growth and economic development and supporting the value of private and commercial property. Green infrastructure provides social benefits through supporting better mental and physical health and well-being, by supporting the quality of place and neighbourhood and by providing opportunities for learning and skills acquisition. Green infrastructure supports environmental outcomes by enhancing habitat and biodiversity, by creating stronger biodiversity networks across the landscape and by mitigating against the effects of climate change (by moderating urban temperatures, absorbing rainfall and sequestering CO2).

Natural England's Green Infrastructure Guidance (2009) proposes a typology for green infrastructure as follows:

Parks and Gardens: urban parks, Country and Regional Parks, formal gardens

Amenity Greenspace: informal recreation spaces, housing green spaces, domestic gardens, village greens, urban commons, other incidental space, green roofs

Natural and semi-natural urban greenspaces: woodland and scrub, grassland (e.g. downland and meadow), heath or moor, wetlands, open and running water, wastelands and disturbed ground), bare rock habitats (e.g. cliffs and quarries)

Green corridors: rivers and canals including their banks, road and rail corridors, cycling routes, pedestrian paths, and rights of way

Other: allotments, community gardens, city farms, cemeteries and Churchyards

Barking and Dagenham is an outer-London borough consisting of a variety of landscape character zones. These are described in detail in Section 4. The urban character of the borough developed in the last quarter of the nineteenth century and the first two quarters of the twentieth century. Much of this development was focused on the establishment of heavy industry along the River Thames corridor and in particular, the Ford Motor Company construction plant. Extensive new inter-war low density housing was provided in parallel on the Becontree Estate. Much of this heavy industry disappeared from the borough in the last quarter of the twentieth century and is being replaced with new housing to accommodate a significant projected increase in population.

Despite this fundamental change to its character over a period of 100 years, the borough has retained significant areas of natural and semi-natural landscape and significant areas of restored / reclaimed derelict land in the east of the Borough. These include Eastbrookend Country Park which is a restored sand and gravel quarry and landfill.

Green infrastructure systems (particularly, the valleys of the Thames, Roding, Beam and Ingrebourne) continue to inform landscape character and quality.

Green infrastructure has a significant role to play is the sustainable development of Barking and Dagenham, over the decades ahead. Climate change will affect all of the world's major cities over the next 50 years and particularly where emissions levels generate localised 'greenhouse effects'.

Climate change will increase flood risk through the prevalence of more extreme weather patterns. Green infrastructure has a vital role to play in mitigating against flood risk. Parks and other green spaces can absorb precipitation, store surface water and release this more gradually into drainage systems thereby increasing its capacity. Trees and vegetation can also stabilise soils and limit topsoil erosion.

In parallel, rising temperatures and higher pollutant levels in the air will increase urban temperatures known as the urban heat island effect. Trees can absorb CO2 and other pollutants from the air while parks and green spaces can have a significant cooling effect on urban areas.

Section 7 of this strategy describes a number of character areas and reference points across the borough. Forming part of London's green infrastructure is integral to each of these, defining the open landscape of the Thames floodplain at Barking Riverside, the urban mix of built environment and greenspace in Barking town centre, the interplay of extensive housing and amenity greenspace across the Becontree Estate, the green fringes of Eastbrookend, the Chase Nature Reserve and Beam Valley Country Park, the re-generate despoiled landscape and enhance the natural environment for the benefit of local people and wildlife across the 40 square miles of the Thames Chase Forest and the transition to Green Belt and farmland to the north of Chadwell Heath. In each of the character areas, green infrastructure defines sense of place, reinforces cultural heritage and aesthetic value. In each area, green infrastructure improves quality of life and supports the quality of places where people want to live and work.

As the population of Barking and Dagenham grows, it is vitally important that the services that green infrastructure delivers for Barking and Dagenham are sustained and the borough's green infrastructure and biodiversity assets protected and enhanced.

1.2 GREEN INFRASTRUCTURE THEMES

1.2.1 GI Integration and Placemaking

The population of Barking and Dagenham will increase significantly over the next twenty-five years. Barking and Dagenham's existing green infrastructure assets already provide a range of economic, social and environmental benefits for people and communities across the borough. As the population grows, it is vital that good quality places are provided for people to live, work and learn in the future.

Green Infrastructure is a vital component of the sense of 'place'. In a recent study over 90% of respondents agreed with the statement 'parks and open spaces can make this a nice place to live'.[2]

Green infrastructure can contribute to sense of place at a number of different scales. Connectivity between these different scales can enhance the extent to which green infrastructure can deliver benefits.

WHAT IS GREEN INFRASTRUCTURE

On buildings and infrastructure: green and brown roofs and living walls can provide habitat for insects and birds, act as ecological corridors and provide cooling and climate regulation for buildings.

Components: green roofs, living walls, gardens, rainwater harvesting

Connecting elements: paths, cycle routes, gardens

At the street level: green infrastructure design can inform the design of streets that are pedestrian and cycle friendly. Street trees can provide habitat linkages, absorb pollution and counteract urban warming. Design should be based on an assumption that ground should be vegetated and not hard paved. Where possible, hard-paved areas should be returned to soil. SuDS systems and rain gardens can absorb precipitation (including precipitation from more extreme weather events that are a consequence of climate change) and contain run-off, attenuating water flows and counteracting flood risk associated with hard surfaces and finite surface water drainage capacity.

Components: street trees, verges, swales, rain gardens, community greens

Connecting elements: footpaths, cycle ways, green links and corridors

At the neighbourhood level: green infrastructure should form part of a neighbourhood-based approach to design for streets for pedestrian and cycle use as well as motor vehicles. Smaller green infrastructure assets (street trees, community greenspaces and road verges for example) can provide physical and habitat links to larger assets (parks and SINCs). Green infrastructure elements can be carefully considered to reflect local ecological and built environment syntax to reinforce neighbourhood sense of place.

Components: amenity greenspaces, playgrounds, playing fields, burial grounds urban woodlands, nature reserve

Connecting elements: footpaths, cycle ways green links and corridors, river valleys

At the strategic level: development plans, masterplans and strategies should include green infrastructure elements that join different parts of the borough together and connect the borough to a network of green infrastructure assets beyond the borough boundary.

Components: civic spaces, green networks, natural and semi-natural greenspaces, forests and woodlands, designed landscapes

Connecting elements: regional/national green networks, river valleys and wetlands

1.2.2   GI Functioning and Ecosystem Services

Aside from 'placemaking', green infrastructure assets and effective green grids deliver a range of ecosystem services of benefit to individuals, families and communities and the success of the borough as a whole.

Economic benefits include the influence that green infrastructure has over the quality of town centres, by supporting property values and commercial rent values. Successful town centres attract inwards investment and creative talent. Effective green infrastructure design protects town centres from the impact of climate change and reduces the carbon footprint of the build environment. Green infrastructure support for enterprise and job creation can impact positively on avoidable health costs and costs of infrastructure management (e.g. water). Health and well-being benefits include avoiding health treatment costs by encouraging active lifestyles that include walking, cycling and play, enhancing

mental well-being through providing access to nature and living, breathing spaces and providing opportunities for food growing and foraging.

Climate change benefits include CO2 storage and sequestration, urban warming mitigation, flood risk management, pollution absorption, energy use reduction and reduction of CO2 footprints (through the encouragement of walking and cycling).

Environmental benefits include the provision of new habitat and new habitat linkages and the prevention of habitat fragmentation. From these flow a range of other benefits including positive impacts on physical and mental health and a range of economic benefits (e.g. the value of crop pollination invertebrate species).

Community and social benefits include support for community cohesion through the provision of more space for people to socialise and play, connecting different communities and neighbourhoods. Green infrastructure provides improved physical connections and opportunities for learning, skills acquisition and volunteering to foster a sense of communal ownership of the local environment. These benefits will be greater if needs of local people are taken into consideration, (e.g. through food growing projects and edible landscape interventions).

The Corporate Natural Capital Account for Barking and Dagenham has assessed and quantified the economic value of some of the benefit flows delivered by ecosystem services across the borough.

1.2.3   GI integration and stewardship

Good quality green infrastructure is a key component of sustainable places across Barking and Dagenham and will be an essential element in the development of new liveable places as the borough develops. But evidence from across the UK suggests that the quality of green infrastructure delivery varies considerably:

- Guidance on best practice for green infrastructure is inconsistent and difficult to navigate.

- Green infrastructure interventions often do not respond sufficiently to local context.

- Different green infrastructure components are considered in isolation from each other (e.g. water management, street trees, nature conservation).

- Green infrastructure is seen as 'less important' than other design influences, especially in areas of high housing demand.

- The quality of green infrastructure design diminishes as the development process proceeds and there can be a lack of enforcement of planning requirements.

- Future stewardship of green infrastructure is not properly funded and adequate governance measures are not put in place to secure long-term sustainability.

- To address this inconsistency, policy for green infrastructure planning for Barking and Dagenham should include the following considerations:

- Green Infrastructure Primary Policy: from the outset, informed by detailed appraisal and assessment, green infrastructure opportunities and design should be developed to support multi-functionality across the range of green Infrastructure functions identified in Section 1.2.2.

- Green Infrastructure Functions: detailed proposals for green Infrastructure

functions should be developed. These should include a consideration of the compatibility of the different needs and human and non-human populations.

- Green Infrastructure Stewardship: should define funding and governance mechanism for the future maintenance of green infrastructure assets and the sustaining of the outcomes that they deliver.

Section 3.4 of the Green Infrastructure Strategy sets out draft Local Plan policies for 'mainstreaming' planning for green infrastructure across Barking and Dagenham.

REFERENCES

1   NPPF Glossary: https://www.gov.uk/guidance/national-planning-policy-framework/annex-2-glossary

2   Greenspace (2010): GreenSTAT visitor survey system

Policy priorities

	Economic growth and employment	Protect and enhance cultural heritage	Protect and enhance the landscape, geodiversity ad natural environment	Biodiversity conservation and enhancement	Climate change mitigation and adaption	Promoting sustainable transport and reducing the need to travel by car	Community cohesion and lifelong learning volunteering	Healthy communities; health and wellbeing
Access, recreation, movement and leisure	■	■				■	■	■
Habitat provision and access to nature		■	■	■	■		■	■
Landscape setting and context for development	■	■	■				■	■
Energy production and conservation	■				■			
Food production and productive landscapes	■	■	■		■	■	■	■
Flood attenuation and water resource management	■		■	■	■			■
Cooling affect	■		■		■			■

Table 1.1: Green Infrastructure and policy priorities

The strategic planning context for this Green Infrastructure and Biodiversity Strategy is set by national, regional and local planning policy and guidance. This adopts a recognised hierarchy that provides strategic planning principles aligned to national and regional policy for green infrastructure across Barking and Dagenham. This is complemented by more localised interventions to reinforce the identity and environmental quality of individual districts and neighbourhoods. This will ensure that current and future green infrastructure provision responds to the particular characteristics of the borough, is well connected and makes the most of local resources and assets. In principal this is a place-led and environmentally focused approach to planning to create, protect and enhance green, healthy and attractive communities and neighbourhoods.

2.1 BARKING & DAGENHAM'S CORPORATE STRATEGIES

Barking and Dagenham's corporate strategic objectives are set out in the Borough Manifesto, the borough's Corporate Plan (2018-22) and the borough Growth Strategy (2013-23). These strategic documents describe how the borough will deliver inclusive, sustainable growth over the strategic periods in question.

2.2   THE 25 YEAR ENVIRONMENT PLAN

The government's long-term strategy for protecting and improving the natural environment is set out in 'A Green Future: Our 25 Year Plan to Improve the Environment'. This encourages the use of the planning system to 'protect key natural and historic assets and encourage high-quality green infrastructure in urban areas'. Chapter 3 focuses on connecting people with the environment to improve health and well-being, creating more green infrastructure and planting more trees in an around our towns and cities. This priority for 'Greening our towns and cities' has direct relevance to Barking and Dagenham's aspiration to be one of the greenest boroughs in London and includes an emphasis on green and blue spaces within the built environment that are considered essential for promoting the health and happiness of communities. The work being carried out as part of the Thames Chase Community Forest and other similar initiatives exemplify how landscapes can be regenerated through green infrastructure initiatives that deliver positive outcomes for communities. The Plan includes a commitment to review and update existing standards for green infrastructure, producing a national framework of standards which are expected to be launched in summer 2020. When published, this framework will provide a strategic point of reference for setting and maintaining standards for green infrastructure across the borough[3].

2.3   THE NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The NPPF places significant emphasis on delivering sustainable development by uniting economic, social and environmental objectives through the preparation and implementation of local plans and strategies that align with the policies set within the Framework. Planning for the protection and enhancement of green infrastructure should consider all three of these objectives in an integrated an holistic manner. This can make a significant contribution to creating attractive and popular places across Barking and Dagenham that have distinct identity and value. Planning for green infrastructure and biodiversity features throughout the NPPF and is central to 'Promoting healthy and safe communities' (Chapter 8) and 'Conserving and enhancing the natural environment' (Chapter 15).

In planning for green infrastructure the NPPF (para 91) aims to achieve healthy, inclusive and safe places which promote social interaction and are safe and

Fig 2.1 Flood attenuation and biodiversity enhancements at Mayesbrook Park

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THE STRATEGIC PLANNING CONTEXT

accessible. High quality public spaces should encourage active and continual use and allow for easy pedestrian and cycle connections within and between neighbourhoods. It should also enable and support healthy lifestyles, especially where this would address identifiable local health and well-being needs.

The NPPF is also clear that planning should contribute to protecting and enhancing valued landscapes and sites of biodiversity value (para 170). It should minimise ecological impacts and provide net gains for biodiversity including establishing coherent ecological networks that are more resilient to current and future pressures. Importantly for this strategy, local plans should take a strategic approach to maintaining and enhancing green infrastructure and habitat networks and plan for enhancing natural capital (para 171)[4].

2.4   PLANNING PRACTICE GUIDANCE (PPG)[5]

The NPPF is supported by a suite of Planning Policy Guidance that provides further detail on interpreting and delivering national policy. The most relevant guidance for this strategy is that for the Natural Environment (2016) that addresses issues of Landscape; Biodiversity and ecosystems; and, Green Infrastructure. It emphasises that green infrastructure is important to the delivery of high quality sustainable development and its provision should be taken into account alongside other forms of infrastructure such as transport, energy, waste and water. National Guidance highlights that 'green infrastructure provides multiple benefits, notably ecosystem services, at a range of scales, derived from natural systems and processes, for the individual, for society, the economy and the environment'. This promotes a strategic approach to green infrastructure which should be evidence based, identifying gaps in the networks and the components and opportunities for improvement and this is a central focus for this Strategy. The guidance states that 'to ensure that these benefits are delivered, green infrastructure must be well planned, designed and maintained. Green infrastructure should, therefore, be a key consideration in both local plans and planning decisions where relevant'.

2.5   THE NEW LONDON PLAN[6]

The current London Plan (2016) provides the spatial development strategy and planning context for Barking and Dagenham. This will soon be replaced by the New London Plan (Consultation Draft 2017) which provides the regional planning policy context for this Strategy. Green Infrastructure and Natural Environment (Chapter 8) promotes a green infrastructure approach (para 8.1.1) which is at the heart of this Strategy. This recognises that 'the network of green spaces, street trees, green roofs and other major assets such as natural or semi-natural drainage features must be planned, designed and managed in a more integrated way to meet multiple objectives' for London. In addition to the more traditional functions of green space such as play, sport and recreation the strategic planning for green infrastructure should include:

- promoting mental and physical health and well-being;

- adapting to the impacts of climate change;

- improving air and water quality;

- encouraging walking and cycling; and,

- conserving and enhancing biodiversity and ecological resilience.

This Strategy for Barking and Dagenham is directly aligned with Policy G1 Green Infrastructure where 'Boroughs should prepare green infrastructure strategies that integrate objectives relating to open space provision, biodiversity

conservation, flood management, health and well-being, sport and recreation.' Policy G6 Biodiversity and Access to Nature ensures that Sites of Importance for Nature Conservation (SINCs) should be protected and that the greatest protection should be given to the most significant sites. Plans should 'seek opportunities to create habitats that are of particular relevance and benefit in an urban context' and 'biodiversity enhancement should be considered from the start of the development process'.

2.6   LONDON'S NATURAL SIGNATURES[7]

Provides a framework to describe and reinforce the relationship between the built and natural areas of London. In drawing on the geology, topography, soils, habitats and landforms of London it provides a description of 22 separate Natural Landscape Areas of which Barking and Dagenham has four:

- Essex Plateau (7)

- Roding River Valley (8)

- North Thames Terraces (9) , and

- Lower Thames Flood Plain (14).

These individual Natural Signatures are described in further detail in Section 4. They are a means of summarising and defining the key natural characteristics of the Natural Landscape Areas and will help local planning policies for Barking and Dagenham take greater account of key natural features and characteristics. They will also help to identify opportunities, through this Strategy, for restoring, enhancing and recreating natural landscapes that directly respond to the specific natural characteristics of the Borough.

2.7   ALL LONDON GREEN GRID (ALGG)[8][9]

The ALGG provides an environmental policy framework promoting the design and delivery of green infrastructure across London. The ALGG Supplementary Planning Guidance (SPG) published in 2012 is aligned with London Plan policies to increase access to open space and nature; improve sustainable travel connections; adapt to the impacts of climate change; and, promote sustainable approaches to design, management and maintenance. More detailed guidance is set out within 11 Area Frameworks[8] that describe spatial priorities for the network and set out a number of detailed green infrastructure projects for implementation. Whilst the delivery programme has lost momentum in recent years and the ALGG is currently under review by the GLA two area frameworks located within and adjacent to Barking and Dagenham continue to provide an important baseline for this Strategy. These Frameworks are:

- Area 2- Epping Forest and River Roding

- Area 3- Thames Chase, Beam and Ingrebourne

Each provides a description of the area including key natural assets, chronology of development, settlement patterns and emerging post-industrial characteristics. Within Barking and Dagenham, Area 2 places significant emphasis on the environmental potential of the Lower Roding and its connection with the Thames; the potential for a new network of open spaces within Barking Riverside; and, improved connectivity between existing green spaces including Abbey Green, Barking Park, Mayesbrook and Goodmayes. To the east, Area 3 describes a series of strategic projects including the extension of the Lower Beam Valley, connections north to Fairlop Waters Country Park incorporating St Chad's Park;

and, a series of projects clustered within the Heart of Barking and Dagenham improving the connectivity between Parsloes Park, Goresbrook Park, Pondfield Park and Valence Park. ALGG Area 3 has in part been superseded by the Thames Chase Plan. Past progress on delivering the full suite of ALGG projects within the Borough has been assessed as part of this Strategy.

2.8   LONDON ENVIRONMENT STRATEGY[10]

Chapter 5 of the London Environment Strategy sets out the Mayor's strategic objectives for Green Infrastructure and Natural Capital across the city. It reinforces policies set within the New London Plan (2017) to promote healthier living; lessen the impacts of climate change; improve air quality and water quality; encourage walking and cycling; store carbon; and, improve biodiversity and ecological resilience. It also promotes the concept of London as the world's first National Park City where more than half of total land cover is green and people and nature are better connected. Barking and Dagenham can seek to increase the proportion of green cover within the Borough in support of this objective.

The strategy emphasises the economic value of green infrastructure through reference to the UK National Ecosystem Assessment and the work of the Natural Capital Committee. This has shown that there is a very good economic case for investing in green infrastructure, estimating that reduced costs to the National Health Service alone would be £2.1bn. Barking and Dagenham has some of the most pronounced health inequalities in the London and targeted investment in green infrastructure to promote well-being and more active communities can seek to capture the value of such health benefits for particular local communities.

London has recently published its own Natural Capital Account[11] which demonstrates that 'public parks and green spaces provide services, such as the improvement of public health, that are valued at £5bn per year, with each £1 spent on public green space providing at least £27 of economic value'. Individual headline accounts have been prepared for each of the London Boroughs that provide a summary of calculated green space benefits. For Barking and Dagenham[12] the annual net value of green space benefits is estimated to be £57.91m with combined physical and mental health benefits within the Borough estimated to be £419m over a period of 30 years (discounting at a rate of 3.5% per year).

2.9   THE LOCAL PLAN[13] (ADOPTED 2010)

Baking and Dagenham is currently in the process of preparing a new Local Plan for 2019-2034. When adopted, this will replace the existing Local Development Framework (LDF) that provides current policy for Open Space and Biodiversity. In terms of strategic green infrastructure provision Policy CM3 Green Belt and Public Open Spaces makes reference to the East London Green Grid, the Blue Ribbon Network and the Barking and Dagenham Landscape Framework Plan although all have since been superseded by the ALGG SPG (2012) and emerging policies in the draft New London Plan (2017). Policy BR3 (Greening the urban environment) requires development proposals to protect and enhance the natural environment.

The LDF notes several initiatives to improve many of the Borough's public open spaces including the National Lottery Heritage Funded Barking Park Masterplan and enhancements to Valence Park that complemented the Valence House Museum refurbishment. It notes that 'new development and regeneration initiatives present a major opportunity to redress these issues' as 'not all of the public open spaces in the Borough are in top condition, and some areas of the Borough have insufficient access to parks and green spaces'. This has been addressed in part by the recent publication of Barking and Dagenham's Parks and Open Spaces Strategy noted on the next page.

The adopted Local Plan is supplemented by a Biodiversity SPD[14] (2012) that sets out how biodiversity should be protected and enhanced through the development process. The document lists the existing Metropolitan, Borough and Local Sites of Importance for Nature Conservation (SINCs) alongside eight Local Nature Reserves (LNRs) within the Borough. A Trees and Development SPD (2012) sets out how tree planting and tree protection must be incorporated into development proposals. Both documents will inform the emerging Local Plan.

More recently a new Biodiversity Survey[15] (2017) for the Borough has updated the evidence base for the emerging Local Plan. The report confirms that all 25 existing SINCs should be retained, proposes the upgrading of certain SINCs and proposes the creation of new SINCs and Wildlife Corridors. In total the report recommends 38 sites are of SINC value in the Borough. The report also provides recommendations for enhancing biodiversity of existing sites. The Biodiversity Survey was ratified by the GLA's London Wildlife Sites Board in March 2017.

2.10 PARKS AND OPEN SPACES STRATEGY

Barking and Dagenham adopted the current Parks and Open Spaces Strategy (POSS) in July 2017. The strategy describes existing park assets, their character and use. The Borough has 28 parks and open spaces with a combined total of 463 hectares that are distributed fairly evenly across the borough, although there is a concentration of provision in the central belt running from Barking town centre in the west to Central Park and Eastbrookend Country Park in the east. Following the GLA's open space hierarchy there are eight District Parks, 11 Local Parks and nine Small Open Spaces and the POSS included a set of 10 masterplans to guide future investment in individual parks.

The Natural Capital Account for Barking and Dagenham used a number of statistical metrics in respect of health, recreation and environmental outcomes to assess the value of the benefits accruing from good quality green infrastructure to the borough and its residents. The value of these benefits was assessed against the cost of managing these green infrastructure assets over time. The Natural Capital Account concludes that the value of benefits accruing from Green Infrastructure outstrips the costs of maintaining these assets by a factor of 4 to 1.

In building on the policy and proposals in the POSS, the purpose of this Green Infrastructure and Biodiversity Strategy is to make the most of these existing open space assets within a better connected green infrastructure network across the borough. Simply put, this Strategy seeks to join up many existing assets into a more integrated and functional open space network. Through this process it identifies areas of new investment and addresses areas of deficiency in access to opens spaces, particularly in the south of the borough as well as protecting and enhancing sites and assets of recognised biodiversity value.

2.11 THAMES CHASE COMMUNITY FOREST

Thames Chase Forest covers 40 square miles of countryside around the London/ Essex borders.

Thames Chase Community Forest encompasses countryside in Barking and Dagenham, Brentwood, Havering and Thurrock. Within its boundaries there has been a concerted effort since 1990 to re-generate despoiled landscape and enhance the natural environment for the benefit of local people and wildlife.

The Thames Chase Trust aims to make the Thames Chase Community Forest an inspirational example of landscape regeneration through cost effective environmental improvements that changes lives and demonstrates these values

through exemplar community led management at the Thames Chase Forest Centre.

The Thames Chase Plan (to 2024) aims to:

- reintroduce the Community Forest concept and the benefits it will bring to East London & South Essex;

- describe the area now recognised as Thames Chase;

- identify strategic objectives and opportunities to achieve a Community Forest in this area;

- complement the statutory plans of the four Thames Chase local authorities;

- promote a rolling programme of projects for which funding is sought

- explain the governance arrangements for Thames Chase that will support co-ordinated delivery

- encourage all communities to get involved and play their part

2.12 BIODIVERSITY SURVEY OF THE LONDON BOROUGH OF BARKING AND DAGENHAM

This brief for this study was the completion of a habitat survey of all existing Sites of Interest for Nature Conservation (SINCs) in Barking and Dagenham and the identification of new and potential SINCs and Wildlife Corridors. The data provided by the survey forms part of the Evidence Base for the council's emerging Local Plan (2019-34).

2.13 RODING BEAM AND INGREBOURNE CATCHMENT PARTNERSHIP

Parts of the Roding, Beam & Ingrebourne Catchment currently fall below the required standards. A range of factors are contributing to this, the most significant being high phosphate levels, low water flows, sediment levels and man-made alterations to river corridors.

The Roding, Beam & Ingrebourne Catchment Partnership (RBICP) is working at both a catchment and local scale, seeking to liaise with landowners to reduce pollution, and encourage works directly within the river corridor to improve its habitats.

REFERENCES

3   HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment

4   Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework

5   The full suite of Planning Practice Guidance is available at https://www.gov.uk/government/collections/planning-practice-guidance [accessed 22/06/19]

6   A full copy of the draft New London Plan is available at https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/download-draft-london-plan-0 [accessed 22/06/19].

7   Natural England (2011), London's Natural Signatures: The London Landscape Framework is available at: http://publications.naturalengland.org.uk/publication/6540238365130752

8   Mayor of London (2012), All London Green Grid Supplementary Planning Guidance is available at: https://www.london.gov.uk/what-we-do/environment/parks-green-spaces-and-biodiversity/all-london-green-grid [accessed 22/06/19]

9   For further information on the ALGG Area Frameworks see: https://www.london.gov.uk/WHAT-WE-DO/environment/environment-publications/all-london-green-grid-and-area-frameworks [accessed 23/06/19]

10   Mayor of London (2018), London Environment Strategy is available at: https://www.london.gov.uk/what-we-do/environment/london-environment-strategy [accessed 22/06/19]

11   Natural capital accounts for public green space in London (2017). See: https:// www.london.gov.uk/what-we-do/environment/parks-green-spaces-and-biodiversity/green-infrastructure/natural-capital-account-london [accessed 23/06/19]

12   Summary Natural Capital Account for Barking and Dagenham is available at:https://maps.london.gov.uk/naturalcapitalreport/index.html [accessed 23/06/19]

13   Barking and Dagenham Local Development Framework: Planning for the future of Barking and Dagenham, Adopted July 2010, see:https://www.lbbd.gov.uk/sites/default/files/attachments/Adopted-Core-Strategy.pdf [accessed 23/06/19]

14   Barking and Dagenham Biodiversity SPD- How biodiversity can be protected and enhanced in the development process, Adopted February 2012, see: https://www.lbbd.gov.uk/sites/default/files/attachments/Biodiversity-SPD.pdf [accessed 23/06/19]

15   Biodiversity Survey of the London Borough of Barking and Dagenham, February 2017, see: https://www.lbbd.gov.uk/sites/default/files/attachments/Report-SINCs-LBB%26D-28-02-2017.pdf [accessed 23/06/19]

Over the past decade there has been a significant increase in research and guidance on green infrastructure planning policy and practice, building on early work published in the preceding decade. Several publications provide useful reviews of academic research, guidance and good practice including Forest Research's Benefits of Green Infrastructure[16] (2010), IFPRA's systematic review of the Benefits of Urban Parks[17] (2013), the University of the West of England's Green Infrastructure Research into Practice[18] (2016), the TCPA-led Green Infrastructure Partnership and Resource Library[19] (GIRL), and the Interreg funded PERFECT programme that also provides a useful register of good practice[20]. Natural England and Defra's work on developing a set of National Green Infrastructure Standards will include an extensive evidence review to underpin a new national framework of standards and this is expected to be launched in summer 2020. In an international context, the UN's 17 Sustainable Development Goals provide a framework for the development of green infrastructure policy. The following documents provide useful references that can inform the planning and help to improve the delivery of this Strategy.

3.1   GREEN INFRASTRUCTURE GUIDANCE (2009)[21]

This Natural England publication provides a detailed definition of green infrastructure and describes the development of policy, the value of planning for green infrastructure and ways to deliver green infrastructure effectively. The guidance includes a useful table that cross-references economic, environmental and social policy priorities with core green infrastructure functions (table 3.1). It also illustrates how the multi-functionality of green infrastructure can support the process of place-making that provides a useful point of reference to inform investment in new green infrastructure and biodiversity assets across the Borough. The guidance also makes reference to useful case studies and Natural England has supplemented these with a set of more in-depth green infrastructure case studies[22] that include two projects within Barking and Dagenham- The Beam Parklands (NE444 / 2013) and Mayesbrook Park (NE394 / 2013).

3.2   GREEN INFRASTRUCTURE: AN INTEGRATED APPROACH TO LAND USE (2013)[23]

The Landscape Institute's position statement provides a set of principles for planning, design, implementation and management of green infrastructure that can be referenced by Barking and Dagenham. It describes both the assets and functions that should be considered as part of an integrated approach to delivering green infrastructure frameworks that include cost effective ways to manage surface and storm water, dealing with waste, adapting to climate change and promoting economic growth and investment. The guide also provides a useful set of case studies that illustrate good practice and the delivery of a wide set of environmental and social benefits that should be secured for the Borough. These include health and recreation, education, food production, social cohesion and enhancing biodiversity. The guide concludes with a checklist of seven steps for developing a strategic approach to green infrastructure that can also be referenced by Barking and Dagenham.

3.3   A GREEN NETWORK STRATEGY (2017)[24]

The Glasgow & Clyde Valley Green Network Partnership (CGV) has established a strong reputation in delivering green infrastructure frameworks across the Glasgow City Region. This incorporates two fundamental functions of a green network; an Access Network that facilitates the off-road movement of people between communities through greenspace; and, a Habitat Network that facilitates

the movement of wildlife through the landscape. Through this process the strategy demonstrates how the City Region can become a more successful and more sustainable place; a natural and resilient place; a much more connected place; and, a low carbon place. These objectives are directly applicable to Barking and Dagenham and the CGV Network demonstrates how this can be delivered through the coordinated work of a number of partners including local authorities, government agencies, infrastructure providers and housing developers.

3.4   MAINSTREAMING GREEN INFRASTRUCTURE[25]

Based at Northumbria University and funded through a Natural Environment Research Council (NERC) Fellowship, the Mainstreaming Green Infrastructure programme provides a useful set of references and resources. This includes a set of Key Reports, Tools and Research Papers to inform the planning and delivery of green infrastructure networks. The Green Infrastructure Planning Policy Assessment Tool is being developed to improve the design and wording of policies that address green infrastructure functions in planning documents and could provide a useful resource for setting strategic and local green infrastructure and biodiversity planning polices across Barking and Dagenham.

3.5   BIODIVERSITY BY DESIGN (2004)[26]

Published over a decade ago, this Town and Country Planning Association (TCPA) publication continues to provide a useful guidance on how to maximise the opportunities for biodiversity in the planning and design of sustainable communities. It includes a set of core design principles to help understand ecological function, securing direct benefits of biodiversity and improving ways for communities to connect with nature. It provides tools and techniques for analysing a site and its context, and ways to masterplan and build multifunctional networks of habitats. It concludes by focusing on the long-term management and stewardship of green infrastructure including the use of management plans, funding strategies and resources. This remains a useful reference for delivering more ecologically rich and functional green infrastructure networks across Barking and Dagenham and in particular in areas of growth and for new development.

3.6   BUILDING WITH NATURE (2017)[27]

This is a green infrastructure certification scheme that has been developed by the Gloucestershire Wildlife Trust and the University of the West of England. It provides a means to demonstrate and quantify how developments have incorporated green infrastructure within their planning and delivery processes. It provides a set of 23 core, well-being, water and wildlife standards on which development schemes are assessed leading to two levels of accreditation: Good, demonstrating high quality green infrastructure, delivering benefits within the boundary of the scheme; and, excellence that provides exemplary quality green infrastructure, delivering benefits within and beyond the boundary of the scheme. Barking and Dagenham could consider recommending or adopting this scheme to evaluate projects at all stages of the development process and promote better standards of delivery and management across the Borough.

BEST PRACTICE GUIDANCE

REFERENCES

16   Forest Research (2010), Benefits of Green Infrastructure, see: https://www.forestresearch.gov.uk/documents/2515/urgp_benefits_of_green_infrastructure.pdf [accessed 23/06/19]

17   IFPRA (2013), Benefits of Urban Parks, a systematic review, see: https://worldurbanparks.org/images/Newsletters/IfpraBenefitsOfUrbanParks.pdf[accessed 23/06/19]

18   UWE, Bristol (2016), Green Infrastructure Research into Practice, see: http://eprints.uwe.ac.uk/29515/1/Green%20Infrastructure%20review%20Final.pdf [accessed23/06/19]

19   Green Infrastructure Resource Library, see: https://www.tcpa.org.uk/green-infrastructure-research-database [accessed 23/06/19]

20   Planning for Environment and Resource eFficiency in European Cities and Towns (PERFECT) register of good practice, see: https://www.interregeurope.eu/policylearning/good-practices/ [accessed 23/06/19]

21   Natural England (2009), Green Infrastructure Guidance, see: http://publications.naturalengland.org.uk/file/94026 [accessed 23/06/19]

22   For Natural England's green infrastructure case studies see: http://publications.naturalengland.org.uk/category/49002 [accessed 26/06/19]

23   Landscape Institute (2013), Green Infrastructure; an integrated approach to land use, see: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2016/03/Green-Infrastructure_an-integrated-approach-to-land-use.pdf

24   GCV (2017), A Green Network Strategy for the Glasgow City Region, see: https://www.gcvgreennetwork.gov.uk/green-network-strategy/file [accessed 23/06/19]

25   Northumbria University and NERC, Mainstreaming Green Infrastructure, see: https://mainstreaminggreeninfrastructure.com/green-infrastructure-resources.php#/ [accessed 23/06/19]

26   TCPA (2004), Biodiversity by Design, see: http://urbed.coop/sites/default/files/Biodiversity%2520by%2520design.pdf [accessed 23/06/19]

27   For further information on Building with Nature see: https://www.buildingwithnature.org.uk/about [accessed 23/06/19]

Fig. 3.1 - Eastbrookend Country Park

4

GREEN INFRASTRUCTURE REFERENCE POINTS FOR LONDON BOROUGH OF BARKING AND DAGENHAM

The mapping of green infrastructure assets has been carried out in the context of defined strategic reference points for built environment, landscape and natural environment in Barking and Dagenham.

4.1   BOROUGH PLACES (REFER TO APPENDIX 4)

The 'Barking and Dagenham Townscape and Socio-economic Characterisation Study'[28] identifies 10 'Borough Places':

- The Becontree Estate
- Barking Town Centre
- Barking Riverside and Thames View
- Dagenham Riverside
- Dagenham East
- Rush Green
- Becontree Heath
- Chadwell Heath
- Marks Gate
- Faircross, Leftley and Upney

These 'Borough Places' are defined by 'the historic growth of the borough, its service centres, the way people live their lives'[29] how residents relate to the place that they live in, residential typologies, landscape characteristics, and a variety of other urban and social considerations.

For the purposes of this Green Infrastructure Strategy, these ten 'Borough Places' have been combined into five green infrastructure zones that more closely reflect the landscape character and 'Natural Signatures' zones (that are described in the following section) within the borough and the pattern of strategic development being proposed in the Local Plan.

Barking Riverside and Thames View and Dagenham Riverside 'Borough Places' have been combined into a 'South' zone which reflects the Thames Flood Plain 'Natural Signatures' character area and the Barking Riverside development.

Barking Town Centre and Faircross, Leftley and Upney 'Borough Places' have been combined into a 'West' zone that reflects the urban characteristics of Barking town centre and the North Thames Terrace 'Natural Signatures' character area.

Becontree 'Borough Place' is retained as a 'Central' zone that reflects the unique character of the Becontree estate and the North Thames Terrace 'Natural Signatures' character area.

Becontree Heath Rush Green and Dagenham East 'Borough Places' are combined as an 'East' zone reflecting the transition to Green Belt and extensive public open space and the North Thames Terrace 'Natural Signatures' character area.

Chadwell Heath and Marks Gate 'Borough Places' are combined into a 'North' zone that reflects the transition to Green Belt land to the north and the Essex Plateau 'Natural Signatures' character area.

4.2   LONDON'S NATURAL SIGNATURES

The 2011 London's Natural Signatures report[30] provides a means of 'encapsulating and evoking the key natural characteristics'[31] of natural landscape areas across London. The purpose of the study is to 'reconnect the natural and built environments in the public imagination'[32]. In this context, 'natural signatures should comprise a point of reference for a Green Infrastructure Strategy for Barking and Dagenham that seeks to use green infrastructure as means of reinforcing sense of place for both built and natural environments.

The Natural Signatures report identifies four distinctive landscape typologies falling within the borough boundary and illustrated on figures 4.3 to 4.5.

Lower Thames Flood Plain (Figure 4.5)

The Thames Flood Plain is defined by a broad band of alluvium laid down by the river over several millennia. This is overlain with terraces of river gravels that rise slowly to demarcate a transient to higher terraces. The area naturally comprises inter-tidal salt marsh, but the development of trade along the Thames led to the creation of docks and the development of industry at the river's edge. The land level in this zone has been raised as a consequence of decades of landfill and more recently, capping. Intermittent areas of grazing salt marshes and reed swamp persist at Barking Creek and the mouth of the Beam.

North Thames Terraces (Figure 4.4)

This area is characterised by gentle topography and gravelly, loamy soils and has been intensively used for agriculture and gravel extraction. The Chase and Eastbrookend areas of the North Thames Terraces are characterised by flooded gravel quarries, river valley wetlands and drier areas of acid grassland and wildflower meadows and stands of trees including black poplar of local provenance.

Roding Valley (Figure 4.2)

In its northern section, a narrow sinuous valley, the Roding widens out and becomes tidal as it approaches its confluence with the Thames. Within Barking and Dagenham, much of the river is canalised but has exposed mud banks at low tide. The valley supports populations of kingfisher and reed warbler as well as species of duck and wading birds in its tidal creek stage.

Essex Plateau (4.3)

The Essex Plateau forms the southern edge of deposits of Bagshot Sands and Claygate Member characteristic of southern Essex. Soils are wet clays and loams that supported extensive area of forest with intermittent open acid grassland.

4.3   STRATEGIC DEVELOPMENT SITES AND SITE ALLOCATIONS

Barking and Dagenham will experience significant demographic change over the next 15 years with housing growth planned to accommodate a rising population. The emerging Local Plan proposes the delivery of 33,960 new homes during the plan period. Much of this new housing provision will be accommodated in high density developments providing limited access to private green space. With the exception of new provision in the Chadwell Heath, most of this development will occur in the south and west of the borough within Thames, Eastbury, Gascoigne, Goresbrook and River Wards.

The link between green infrastructure and economic development, health and well-being is well researched and documented. The Natural Capital Account for Barking and Dagenham, prepared in 2017, identifies the avoidable health costs of inactivity across Gascoigne, Goresbrook and Thames Wards between 2016 and 2041.

Development sites offer the potential to support green infrastructure resilience through building an 'urban greening factor' into masterplanning and detailed design. Green infrastructure and biodiversity can be enhanced through the provision of semi-natural vegetation (echoing vegetation classifications typical of the site area), sustainable urban drainage, tree planting, extensive green roofs and green walls. The urban greening factor approach can deliver net biodiversity gain for new development sites.

These elements can in turn reinforce the effectiveness of a green infrastructure grid linking different green infrastructure elements across the borough.

4.3.1   Strategic Development Sites

The emerging Local Plan identifies the six strategic development sites below for significant new housing provision:

- Barking Riverside
- Beam Park/Ford Stamping Plant
- Barking Town Centre
- Chadwell Heath Industrial Area
- Castle Green

4.3.2   Other site allocations

The council has identified a further 75 allocation sites that are evenly distributed across the borough, but with a concentration in Village, Albion and Heath Wards.

4.3.3   Green Infrastructure Elements

Section 5 describes in detail green infrastructure elements in Barking and Dagenham (and beyond the borough boundary). These are the borough's principal green and blue infrastructure elements that deliver the ecosystem services and range of economic social and environmental outcomes described in Section 1. Section 6 sets out a 'green infrastructure network' for the borough that connects these different green infrastructure assets and identifies gaps in their connectivity. These gaps could be addressed through the creation of future green infrastructure assets based on the typologies set out in Section 5.

4.4   GREEN INFRASTRUCTURE REFERENCE POINTS OUTSIDE THE BOROUGH

4.4.1 Thames Chase Community Forest

Thames Chase Community Forest encompasses countryside in Barking and Dagenham, Brentwood, Havering and Thurrock. Within its boundaries there has been a concerted effort since 1990 to re-generate despoiled landscape and enhance the natural environment for the benefit of local people and wildlife.

4.4.2 The Land of the Fanns

The Land of the Fanns is an area of approximately 180 km2 (70 square miles) located partly in East London and partly in South Essex, along the north bank of the River Thames. It extends from Dagenham in the west to Stanford-le-Hope in the east, and Brentwood in the north to Purfleet in the south and includes settlements such as South Ockendon and Orsett.

The project scheme draws inspiration from 19th century parish records of a more unified landscape celebrated in Leslie Thompson's book The Land that Fanns and
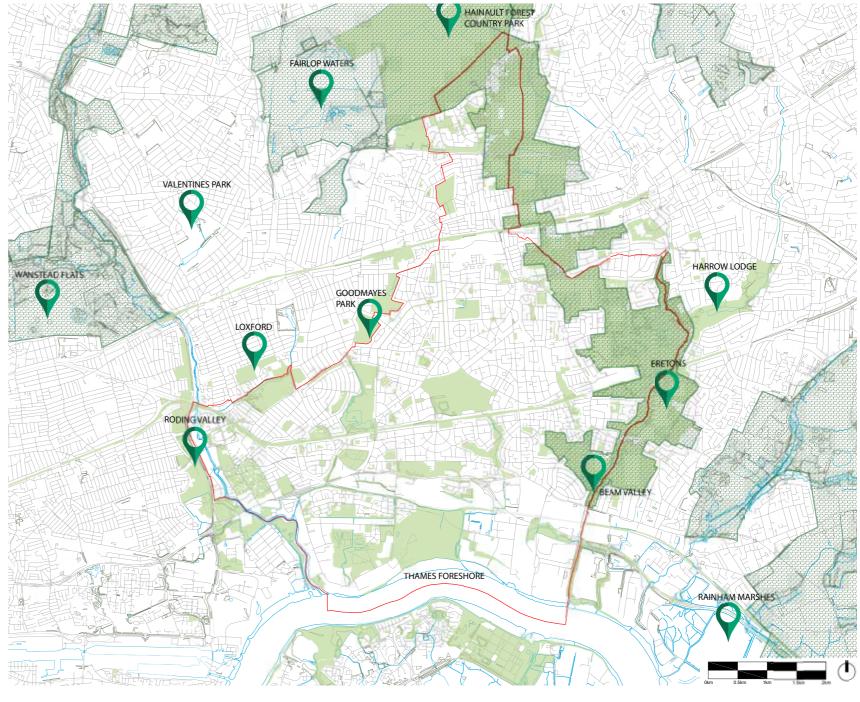
Figure 4.1 Sub regional green infrastructure connectivity

LONDON BOROUGH OF BARKING & DAGENHAM BOUNDARY   GREENSPACES   GREENBELT

will seek to this unique landscape and strengthen attachments to it through a variety of projects focusing on history, landscape development, land use, ecology and biodiversity.

4.4.3 River Rom wetland restoration project
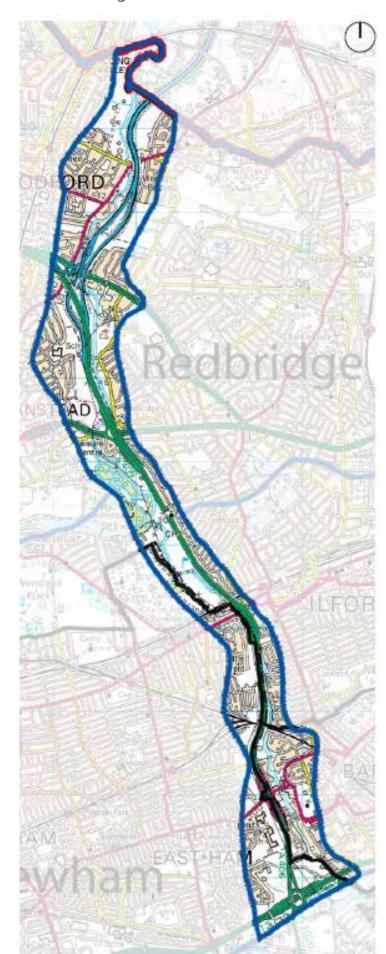
The Land of the Fanns Partnership Scheme are delivering a river and wetland restoration project along the River Rom in Grenfell Park and parts of the Chase Local Nature Reserve.

The project aims to reconnect the river to the flood plain and increase biodiversity.

REFERENCES

28   Allies and Morrison (2017), Barking and Dagenham Townscape and Socio-economic Characterisation Study

29   Bid: page 244

30   Alan Baxter et al (2011), London's Natural Signatures report

31   Bid: page 5

32   Ibid: page 6

Fig 4.2 Roding Valley
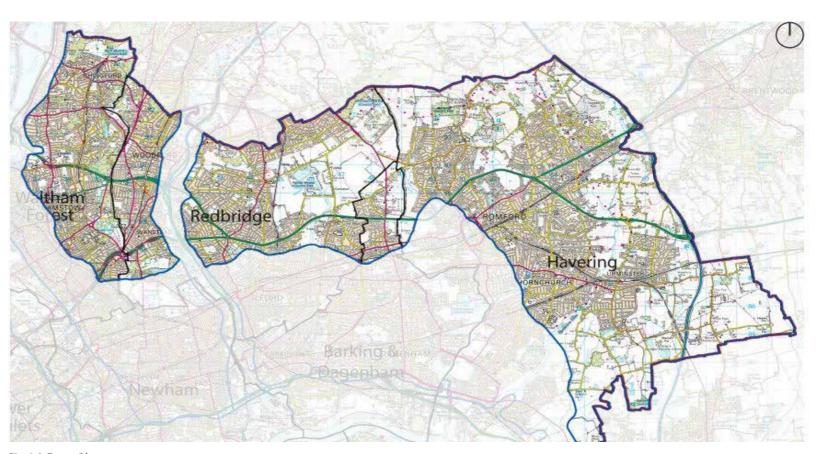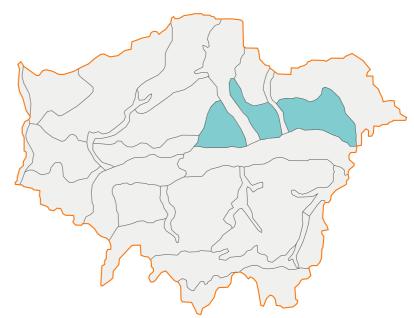
Fig 4.3 Essex Plateau

Fig 4.4 North Thames Terrace
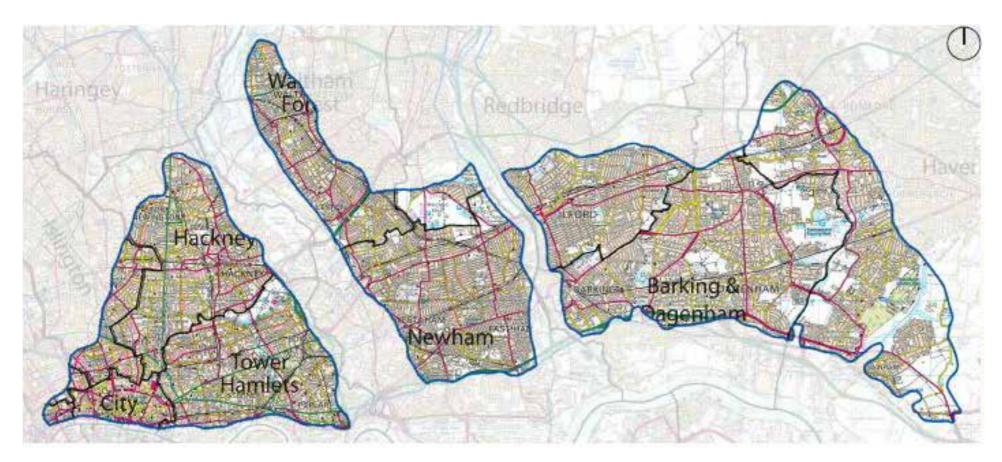
Fig 4.5 Lower Thames Flood Plain

Green infrastructure within Barking and Dagenham consists of a variety of different typologies that together provide a network of assets that can individually and collectively deliver the range of economic, social and environmental benefits described in Section 1 of this report. In providing a strategic framework and for practical reasons, this Green Infrastructure and Biodiversity strategy limits itself to consideration of green infrastructure assets of a certain scale. Certain typologies have been excluded from consideration. It should be noted however, that green infrastructure elements that fall out of scope for this study can individually and collectively contribute to the range of outcomes generated by green infrastructure as a whole.

5.1   PARKS AND OPEN SPACES

Green infrastructure within parks has the potential to deliver a number of outcomes including sustainable economic development (through property value uplift), health and well-being outcomes, climate change resilience, sense of place and biodiversity enhancement.

Barking and Dagenham has 28 parks and open spaces. In respect of the London Plan Parks Typology the borough has eight 'District' parks, 11 'Local' parks and nine 'Small' parks.

Parks are reasonably well distributed across the borough but there are deficiencies in provision (when assessed against London Plan accessibility criteria) in the extreme north and the south-east of the borough.

The 2017 Parks and Open Spaces Strategy included an assessment of the quality of Barking and Dagenham's parks against a set of criteria derived from PPG17 and 'Green Flag' award criteria and cross-referenced against a set of criteria used by the borough to assess the quality of parks in 2003.

The 2017 assessment found that two of the borough's parks were in 'good' condition, seven parks were of 'average' condition, 17 sites were in a 'poor' condition and two sites were in a 'bad' condition.

5.2   SITES OF IMPORTANCE FOR NATURE CONSERVATION

Sites of Importance for Nature Conservation are significant in delivering a number of positive outcomes in respect of biodiversity and climate change resilience, health and well-being outcomes and sense of place. Sites of Importance for Nature Conservation support ecological resilience and the extent to which this outcome is secured can depend on the degree of connectivity between different sites. A network of inter-connected sites can deliver greater ecological resilience than single isolated sites. Section 8 of this report proposes approaches to design for biodiversity that can support this outcome.

Barking and Dagenham currently has 25 designated Sites of Importance for Nature Conservation. The designation of a further 14 sites is proposed in the 2017 'Biodiversity Survey of the London Borough of Barking and Dagenham'[33]

It is also proposed that:

1. Two existing Borough Grade 1 SINCs (Beam Parklands and Beam Valley Country Park) are combined and upgraded to a new single Beam Valley Site of Metropolitan Importance.

2. Mayesbrook Park and Scratton's Farm Ecopark sites are upgraded from Borough Grade 2 Sites to Borough Grade 1.

3. Gascoigne Road Pumping Station Rough is upgraded from a Local Site to a Borough Grade 2 Site.

Sites of Importance for Nature Conservation are distributed across the borough but in terms of area there is concentration along the borough's eastern boundary.

The Draft London Plan (July 2019) defines Areas of Deficiency in access to nature as areas where people have to walk more than one kilometre to reach a publicly accessible Metropolitan or Borough Site of Importance for Nature Conservation (SINC).

The Accessible Natural Greenspace Standard (ANGSt) established by Natural England recommends the following access for residents to natural greenspace:

- Area of at least 2 hectares no more than 300 metres (5 minutes walk) from home;

- Area of at least one accessible 20 hectare site within two kilometres of home;

- One accessible 100 hectare site within five kilometres of home; and

- One accessible 500 hectare site within ten kilometres of home;

- Plus a minimum of one hectare of statutory Local Nature Reserves per thousand population.

5.3   ALLOTMENTS

There are five orchards planted and managed as orchards within parks:

- Central Park

- Barking Park

- Pondfield Park

- Padnall lake

- Greatfields Park

There are 17 allotment sites managed by the Council across Barking and Dagenham.

There are also the following food growing locations:

- St. Chads Park- an 'edible woodland' with crab apple and wild pear trees.

- Dagenham Farm – orchard trees mixed with other trees.

- Valence House Archives and Local Studies Centre- an allotment and an orchard.

- Eastbrookend Country Park – Plans for fruit trees / orchard planting.

- Eastbury Manor House- Fruit trees and herb garden.

- Barking Park – food growing club managed by Company Drinks, a Community Interest Company.

- Barking Riverside – orchards in communal areas.

- Growing Communities, Dagenham Farm- produce over 5 tonnes of organic vegetables a year.

Every One Every Day has supported residents to create 6 "open corners"

- Ripple Road Open Corners: Upney Meadow; Westbury Community Space; and The Wild Garden

5
GREEN INFRASTRUCTURE ELEMENTS IN BARKING AND DAGENHAM

- Church Elm Lane Open Corners: Junction of The Heathway and Arnold Road; and People's Corner

- 47 Thames Road, Barking

Every One Every Day have also planted around 12 open orchards across the borough.

5.4   WATERWAYS AND WATER BODIES

Barking and Dagenham is dissected by a significant number of watercourses which eventually join the Thames. These define the character of the borough, marking both the borough boundaries as well as the transition from one 'Natural Signatures' character area to another. A significant proportion of the south of the borough lies within Flood Risk Zone 3 along the valleys of the Roding, the Mayes Brook (its tributary), the Gores Brook and the Beam. The River Thames is also a source of flood risk.

An important green infrastructure function of watercourses is to manage water sustainably and mitigate against flood risk but rivers and watercourses are also important biodiversity corridors and provide health and well-being benefits in their capacity to act as connecting amenity corridors. Most of the borough's waterways and their tributaries are also designated as SINCs.

Water bodies within parks and open spaces also perform an important function in attenuating flood risk and recent investment in restoring more natural river profiles has increased this functionality. Naturalisation has also improved biodiversity and access to nature and has reduced level of water pollution. The Beam Parkland Natural Capital Account[34] suggests that the site delivers £591,000 in flood risk mitigation benefits annually.

Section 8 sets out the principles that inform design considerations in respect of the flood attenuating capacity of rivers and watercourses.

5.5   SCHOOL PLAYING FIELDS (REFER TO APPENDIX A1)

Playing fields and green space around schools are important green infrastructure elements, acting as biodiversity corridors to connect other elements. School playing fields also absorb precipitation and air-borne pollutants and help to moderate school building performance. Recent school grounds green infrastructure-focused initiatives across Barking and Dagenham include habitat creation, tree planting and food growing.

5.6   PRIVATE GREENSPACE (REFER TO APPENDIX A1)

As an outer London borough, Barking and Dagenham has hitherto been largely typified by relatively low density, extensive housing provision. Much of this housing has been provided with both front and rear garden private open space. The inter-war housing developed across the Becontree Estate typifies this housing typology.

Collectively, these areas of green space constitute a good proportion of the surface area of the borough. The impact of changes in use of these spaces can have a significant impact on green infrastructure outcomes. It has been common practice over the past two decades to hard-pave front garden areas for private off-road parking and this has had a significant impact on the capacity of surface water drainage systems to cope with flash flooding events.

The front and rear gardens of streets of terraced and semi-detached houses can constitute significant wildlife corridors, particularly where these connect to larger green infrastructure assets such as parks, waterways and Sites of Importance for

Nature Conservation. Recent research by GiGL has demonstrated the significance of front and rear gardens to green infrastructure capacity.

Whilst many of these spaces are private, residents and local businesses can be encouraged to reduce the use of paving and decking, plant native flowers, shrubs and trees, install nest boxes and reduce their use of pesticides, herbicides and peat. Communal green space, around blocks of flats for example, can be significantly improved to provide access to nature and for food growing.

On new development the landscaping of new gardens should minimise the use of artificial surfaces and incorporate native planting.

5.7   CYCLE NETWORKS AND PUBLIC RIGHTS OF WAY

Barking and Dagenham is well-provided with a network of on and off-road cycle routes. Connecting town centres, transport intersections, public open spaces and other key locations.

The borough's Third Local Implementation Plan 2019-2041 includes proposal for the creation of safe and accessible facilities for cyclists developed in parallel with sustainable urban drainage for streets and measures to address issues of atmospheric pollution. Significant projects in the Local Implementation Plan include the Valence Avenue Healthy Streets Corridor Scheme and the Marks Gate to Chadwell Heath Station Healthy Streets Corridor Scheme, both of which form part of the green infrastructure grid described in Section 4.

The borough has a limited number of public rights of way. These have been assessed in the context of this study and while they are significant on a local level and for local connectivity, they have not been found to be significant in the context of determining the green infrastructure grid. The strategic cycling network does require upgrading to further enhance accessibility and usage.

5.8   STREET TREES

Street trees can perform a significant role in joining green infrastructure assets otherwise separated by built environment elements. Street trees are important elements in place making, mitigate against urban warming, absorb air-borne pollutants and can provide biodiversity corridors for birds and bats and support populations of invertebrates. Street tree planting is commonly carried out in the context of the implementation of 'healthy streets' projects. New street trees should be native species and from UK-grown stock.

There has been a progressive expansion of street tree planting in Barking and Dagenham with specific concentrations of schemes in Longbridge Ward and along key strategic routes north-south (Lodge Avenue- Becontree Avenue – Valence Avenue) and east-west (Woodward Avenue – Hedgemans Road and Becontree Avenue east). Barking and Dagenham's Parks and Open Spaces Tree Strategy provides guidance on the benefits of tree planting, species and location choice.

5.9   EXISTING GREEN INFRASTRUCTURE ON MAJOR DEVELOPMENT SITES (SWALES, GREEN WALLS, GREEN ROOFS)

An informed approach to masterplanning and building design can enhance the performance of swales, green roofs and green walls as green infrastructure assets. These assets can deliver a number of benefits – reducing surface water run-off, providing habitat, moderating building performance in respect of insulation and cooling, creating new open space and contributing to distinctiveness and sense of place.

Section 8 of this document and Barking and Dagenham's Sustainable Drainage Systems SuDS guidance (currently in draft) provide guidance on how green infrastructure capacity can be successfully incorporated into major development sites.

The adopted London Plan's Sustainable Design And Construction Supplementary Planning Guidance (April 2014) (London Plan 2011 Implementation Framework) provides further guidance in this area.

5.10   URBAN GREEN SPACES AND ACTIVE CORNERS

The council has identified over 4,000 individual 'amenity greenspaces' across the borough in its ownership and is developing new amenity green spaces policy vision for both to preserve and better utilise as much of this greenspace as possible.

The main proposals within the emerging amenity green spaces policy are as follows:

- Eliminating the possibility that these spaces can be transformed into car parking as a function of the borough's aspiration for Barking and Dagenham to become 'the green capital of the capital'.

- Restricting options for disposal unless the council has developed a strong business case for this.

The key initiatives that are already in place or are in development are as follows:

- Exploring partnerships with external partners and agencies (e.g. Trees for Cities)

- Developing a Sport London 'active corners' programme

- Working with residents leading the development of 6 to 10 green spaces on Becontree Estate as part of the celebration of the 100th anniversary of the founding of the estate

- Creating growing, playing and socialising spaces in partnership with external partners (Participatory Cities, Create London and Becontree 100) and local residents.

The value of amenity greenspaces to the borough's green infrastructure portfolio is captured in green infrastructure grid mapping.

5.11   THAMES CHASE PARTNERSHIP

The Thames Chase Partnership is delivering significant opportunities to return former industrial land to effective green infrastructure and to deliver a range of economic, social and environmental benefits by involving local communities in future stewardship.

5.12   GREEN INFRASTRUCTURE CAPACITY IN NEIGHBOURING BOROUGHS

The Green Infrastructure Strategy for Barking and Dagenham connects assets within the borough but also seeks to link with other green infrastructure assets outside the borough. These include the Thames and its foreshore, the valleys of the Roding and the Beam, Rainham Marshes, Hainault Forest and Wanstead Flats.

REFERENCES

33   Biodiversity Survey of the London Borough of Barking and Dagenham: Denis J Vickers

34   Beam Valley Parklands Natural Capital Account: GLA/eftec (2015)

6.1 DESCRIPTION OF A GREEN INFRASTRUCTURE GRID NETWORK FOR BARKING AND DAGENHAM

Connectivity is an essential element of green infrastructure performance. Section 1 sets out the economic, social and environmental outcomes delivered by green infrastructure. This section proposes a new green infrastructure grid network for Barking and Dagenham which will be an essential element in securing these outcomes. The new grid network will form physical connections between the different green infrastructure elements described in Section 5. Where possible, new connections will provide continuous green infrastructure, but where a continuous physical connection is not possible, unconnected islands of habitat or green infrastructure can form 'stepping stones'. In the short and medium term, these are the best options for attaining green infrastructure continuity because of the presence of barriers such as major roads, rail and industrial infrastructure.

The two-tier grid network is proposed for the borough.

Category A grid network routes are of strategic significance, connecting major green infrastructure elements and different character areas on a borough-wide basis. Category A network routes will also connect the borough to networks and green infrastructure elements in neighbouring boroughs.

Category B grid network routes are more local in nature and connect adjoining character areas and green infrastructure elements.

The proposed grid network routes are for the most part continuous, but where discontinuities have been found these are identified and new green infrastructure initiatives proposed to address these. These initiatives are described in detail in Section 7.

When assessing green infrastructure connectivity across Barking and Dagenham, a green grid has been proposed that is most effective in connecting the borough's green infrastructure assets. Where clear green infrastructure connections do not exist, where identified green grid routes can be connected, or where other options for connectivity can be identified, 'Alternative Routes' have been identified and mapped. Generally speaking, these are less effective than the main network in connecting the borough's green infrastructure.

Four Category A grid network connections are proposed as follows:

Route GR1: connects the Furze House Farm SBINC with Green Belt land and Hainault Forest Country Park to the north in the London Borough of Redbridge. The route connects to a further four proposed SINC sites to the south (Marks Warren Quarry, Marks Hedge, Cranfield Golf Centre and Chadwell Heath Cemetery) and connects these to the existing Grade 2 SBINC at Romford Line Rail sides. To the south, the route follows the existing on-road cycle route on Whalebone Lane, Whalebone Road South and The Heathway to Goresbrook Road where it intersects with NCR 13 and green infrastructure grid route A2. The route is characterised by intermittent street tree planting (with a gap in planting between the High Road and The Heathway and to the south of Dagenham Heathway). The route also connects a number of smaller community green spaces (many of which are roadside verges or road junction greenspaces) which could support additional tree planting or be managed for biodiversity outcomes. The route also connects a number of large school grounds (The Warren School, Robert Clack School, Trinity School).

Route GR2: follows the route of NCR 13 as it traverses the southern part of the borough. To the east the route connects to Rainham Marshes to the south and Hornchurch Country Park to the north. Wi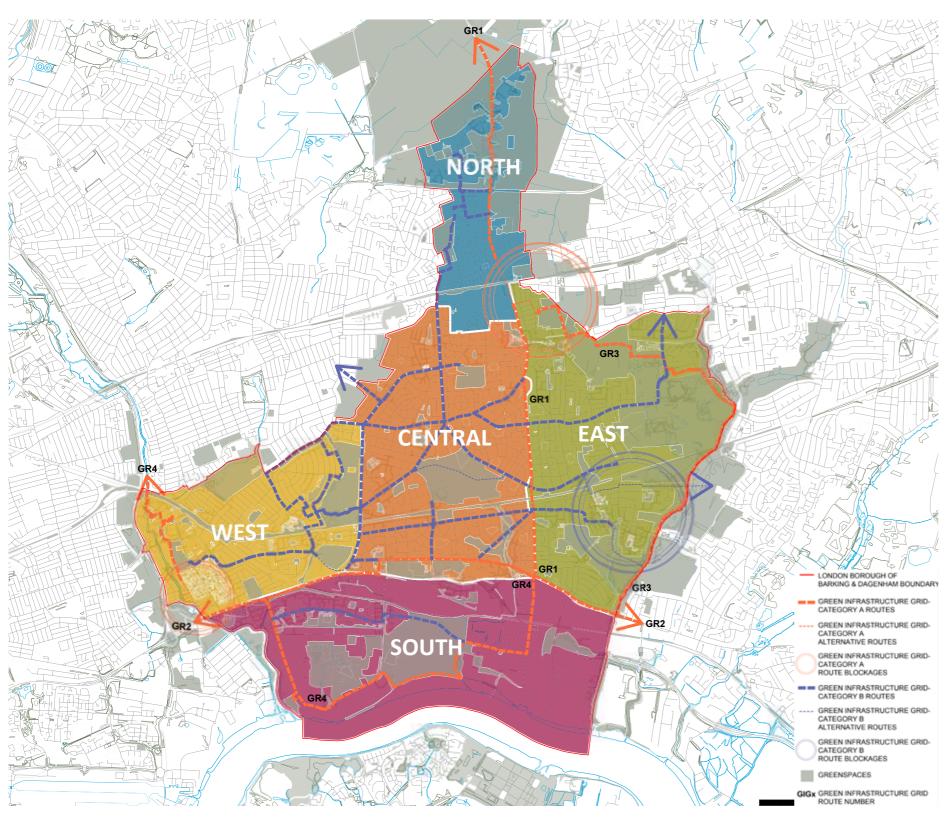thin Barking and Dagenham, the route will connect the southern edge of Beam Valley Country Park, Goresbrook Park and Goresbrook. The route follows the northern edge of Castle Green park and will become part of the Castle Green masterplan in this section. To the west, the route follows the A13 and leaves the borough at the Alfred's Way bridge over the river Roding. The route connects to routes to the north skirting the A12 corridor and Wanstead Flats (Redbridge) and to the west to New Beckton Park and King George V Park (Newham). Much of this route lies within the existing busy road corridors of the A1306 and A13. A planned improvement scheme for the A1306 will complement tree planting between The Heathway and Thames Avenue but there are opportunities to extend this programme of planting to the east as far as Dagenham Avenue. Intermittent opportunities for further tree planting and relaxed mowing regimes present along the A13 corridor as far as the elevated section to the east of Ripple Road.

Route GR3: runs along the eastern boundary of the borough connecting Green Belt land and Hainault Forest Country Park to the north (via Route 1) in the London Borough of Redbridge with proposed SINC sites to the south (Marks Warren Quarry and Cranfield Golf Centre). The route connects to the eastern end of the existing Grade 2 SBINC at Romford Line Railsides. To the south of Crow Lane, the route can connect to Central Park through an existing Public Right of Way lying partly within the London Borough of Havering (but including the Wantz Lake Site of Borough Importance for Nature Conservation).

From Central Park, the route connects to Eastbrookend Country Park and the Chase Nature Reserve (both SMINC's). To the east lies Green Belt land at Harrow Lodge Park, Hornchurch Country Park and Berwick Glades, with Rainham Marshes to the south. From a junction with Route A2 at the southern end of Beam Valley Country Park, the route follows the eastern edge of the Chase Nature Reserve along the valley of the Beam River that forms the eastern boundary of the borough. The route connects a number of open space and SINC sites along both sides of the river valley including the Bretons Outdoor Centre (in Havering), Beam Valley Country Park, the Leys and Old Dagenham Park and Dagenham Breach and Lower Bream River SMINC. At its southern end at the confluence of the Beam with the Thames, connectivity along the Thames is blocked by industrial infrastructure to the east and west.

Route GR4: is significant because of its function in connecting green infrastructure opportunities east-west across the borough through the Barking Riverside development. Green infrastructure provision at the eastern and western edges of the borough (between the Beam River and the River Roding) are impeded by industrial infrastructure that abuts directly onto the Thames. In the longer term, these areas might move from industrial to non-industrial land uses. In the short term, the opportunity exists to create green infrastructure capacity within the Thames tidal range along the river edge. River edge greening would have the added value of being a corridor for many migrating species. Any route adjacent to the Thames will need to ensure disturbance of wildfowl is avoided. Access to Barking Riverside would currently be provided by a route that runs from grid route A2 at Chequers Lane to the edge of the Barking Riverside development to the east of Reef Street. The route is interrupted by the railway line at Dagenham Dock. The reinforcement of intermittent street tree planting and new approaches to roadside verge management could be considered as options for the extension of green infrastructure provision in this section. To the west of Barking Riverside, River Road provides a connection to Routes GR2 at Alfred's Way. The route connects to Barking Creek Park but access to the Roding valley is otherwise restricted by waterfront light industrial land uses. Along the River Road section, generous road edges present opportunities for street planting as far as Atcost Road and intermittently to the north of Barking Creek Park. A number of Category B grid network connections connecting green infrastructure assets on a local level have been identified.

6

THE GREEN INFRASTRUCTURE NETWORK

An assessment of green infrastructure connectivity has been undertaken in the course of developing proposals for the green infrastructure grid. This has revealed potential for interventions along the identified green infrastructure grid corridors that will strengthen green infrastructure capacity overall.

Fig 7.1 GI Strategy Character Areas

7

STRATEGIC GREEN INFRASTRUCTURE AND BIODIVERSITY PROJECTS BY AREA

Legend:

- LONDON BOROUGH OF BARKING & DAGENHAM BOUNDARY
- GREEN INFRASTRUCTURE GRID- CATEGORY A ROUTES
- GREEN INFRASTRUCTURE GRID- CATEGORY A ALTERNATIVE ROUTES
- GREEN INFRASTRUCTURE GRID- CATEGORY A ROUTE BLOCKAGES
- GREEN INFRASTRUCTURE GRID- CATEGORY B ROUTES
- GREEN INFRASTRUCTURE GRID- CATEGORY B ALTERNATIVE ROUTES
- GREEN INFRASTRUCTURE GRID- CATEGORY B ROUTE BLOCKAGES
- GREENSPACES
- **GIGx** GREEN INFRASTRUCTURE GRID ROUTE NUMBER

7.1 Southern Area

Description

The Green Infrastructure Strategy southern area amalgamates the Barking Riverside, Thames View and Dagenham Riverside 'Borough Places' and proposes a broad correlation between these character areas and the 'Thames Floodplain' Natural Signatures area.

Key issues

Barking Riverside will provide the majority of the green infrastructure interventions within this part of the borough. The development of Pylon Park and the creation of green infrastructure within development sites (including SuDS, swales, green roofs and walls, and ecomimicry-based soft landscaping) will all add GI capacity and connectivity to the area.

Ecomimicry is centred on the species, habitats and ecosystems that are typical of a particular geographic location. This approach has been used with significant success in Barking Riverside, to create biodiverse rich, mosaic habitats that were features of the original pre-industrial landscape and the post-industrial brownfield land that largely replaced that landscape.

The major issue affecting green grid connectivity is the limits on continuity presented by the A13 road corridor and the east-west main railway line running between Barking and Rainham. These can be mitigated by initiatives to develop capacity along these corridors (e.g. through street tree planting, adapted approaches to grass verge and pocket green spaces management). The potential to create green bridges across transport infrastructure should also be considered.

Barking Riverside will open access to the Thames frontage and offer opportunities for biodiversity-driven approaches to the management of the inter-tidal zone. The River Thames and its tidal tributaries support a rich variety of habitats and species that need to be protected. It is vital however that existing biodiversity, including wildfowl, is protected. Access to the Thames is intermittent however; industrial infrastructure currently occupies the river frontage to the east and the west of Barking Riverside. In the long term, the option exists to adapt the character of these areas in a way that would support enhanced green infrastructure connectivity on the river edge. In the interim, it is possible to consider biodiversity-focused projects within the inter-tidal zone along the whole Thames frontage as far as the constraints of current light-industrial uses allow.

Given these constraints it is not currently feasible to establish green infrastructure connectivity between the Beam River grid route GR3 and an east-west route connecting to Barking Riverside. Connectivity is provided via a strategic route on Chequers Lane and Choats Road to the east and River Road to the west and a secondary route (a currently designated cycling route) connecting Choats Road with River Road via Bastable Avenue. This route will skirt the northern edge of the planned Pylon Park.

Green infrastructure linkages and opportunities:

- Barking Riverside: Pylon Park, Barking Riverside public realm, green roofs and walls, Thames frontage inter-tidal initiatives and ecomimicry projects site wide. Chequers Lane/Choats Lane: street tree planting and grass verge management interventions. The Barking Riverside Community interest Company will play an important role in the future delivery and stewardship of these projects.

- River Road: limited street tree planting and verge management interventions in southern section. Greater opportunities to link existing planted road edges and introduce further street tree planting in northern section.

- Choats Road north: interface with Pylon Park.

- Bastable Avenue: extensive opportunities for adoption of modified grass verge management and 'gapping up' of existing street trees.

- A new green link along the Roding via Newham into Redbridge and to Wanstead Flats. There are significant railway corridor barriers to the creation of this route to the north of Leigh Road Sports Ground.

- Opening up the frontage of the Roding at its confluence with the Thames and linking this to Barking Riverside. The development of this route will require access to land through major developments to address major barriers.

- Further greening of the A13 road corridor

- Connecting green infrastructure route GR 2 with the Thames at is confluence with the Beam by creating an extension of GR 3 in the lower Beam valley. This could link with wider green infrastructure assets to the east (especially Rainham Marshes). These potential connections should be balanced with a need to protect the biodiversity value of the lower Beam Valley as a site linking the upper Beam valley with the Thames, its foreshore and inter-tidal zones.
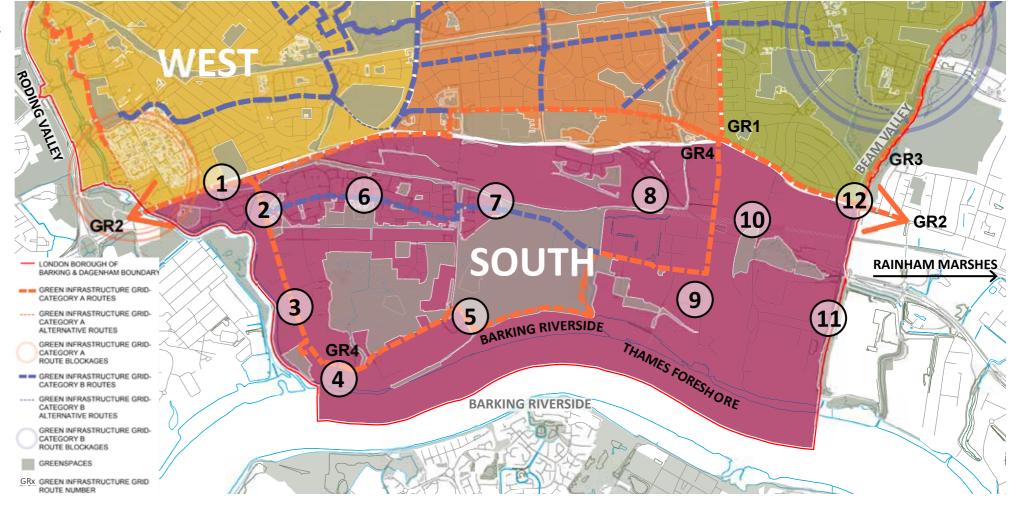
Fig 7.2 Southern Area

A13 River Road   **1**

Bastable Avenue   **2**

River Road- North   **3**

River Road- South   **4**

River Road- East   **5**

Bastable Avenue   **6**

Figure 7.3 Southern Character Area

Bastable Avenue ⑦

Choats Road ⑧

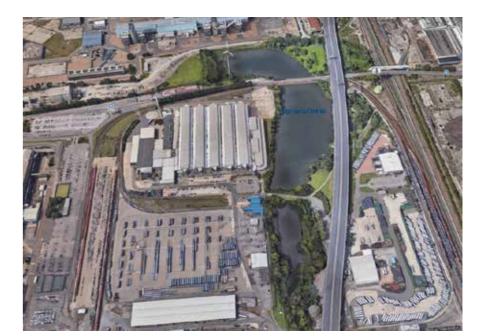Chequers Lane ⑨

Chequers Lane ⑩
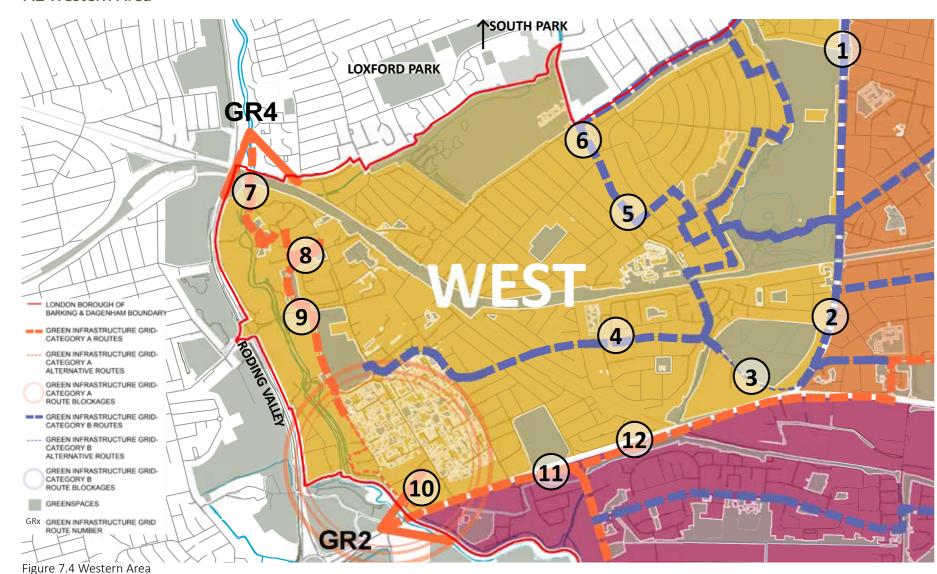

Beam River - Thames confluence ⑪

Dagenham Breach ⑫

Figure 7.3 Southern Character Area

7.2 Western Area

Figure 7.4 Western Area

Green infrastructure linkages and opportunities:

- Greening of Longbridge Road and its verges: Improve pedestrian and cyclist access across the 'Fishtail' roundabout at the junction of Longbridge Road with the A124.

- Roding Valley/Abbey Road:
  street tree planting and community greenspace development.

- A13/NCR13: adapted management regimes and street tree planting at key junctions.

- Mayesbrook Park to Barking Park: reinforced street tree planting and roadside verge management changes.

- Barking Park to Mayesbrook Park and Goodmayes Recreation Ground: new street tree planting; road verge adaptation; community greenspace development; swales and other SuDS initiatives.

- De-culvert the Gores Brook in Parsloes Park

Description:

The Green Infrastructure Strategy western area amalgamates the Barking Town Centre and the Faircross, Leftley and Upney 'Borough Places'. This is the most urbanised portion of the borough but one that includes a number of key green infrastructure assets including Castle Green and Barking Park. The western area is an important gateway to the Roding Valley that forms the western boundary of the borough and Wanstead Flats and Epping Forest to the north west and the western end of a series of strategic and local green infrastructure routes connecting Barking Park, Mayesbrook Park, Parsloes Park to the Beam Valley and its suite of SINCs and Green Belt land on the eastern fringes of the borough.

Key issues:

Although the Roding Valley (from its confluence with the Thames) is a key green infrastructure corridor connecting the borough with Wanstead Flats and Epping Forest, north-south connectivity across this area is affected by its densely urban nature and the preponderantly industrial uses of the river frontage between the Thames and Castle Green (with intermittent green connectivity in some sections). North-south connectivity is thus via Gascoigne Road and Abbey Road, where new street tree planting and community greenspace development opportunities could be developed.

The A2 strategic green infrastructure grid route follows the A13/NCR 13 corridor at the southern edge of this section. To the west of Gascoigne Road, the A13 is in an elevated section presenting no opportunities for green infrastructure intervention. To the west, opportunities exist to further develop recent initiatives with green infrastructure initiatives (e.g. A13/River Road junction) and to green the corridor (e.g. A13/Lodge Avenue junction). To the north, a connection could be established from the Roding to Barking Park via Harts Lane and the Barking storm relief channel, although the later has an industrial character at its western extreme.

To the east, a number of local green infrastructure grid connections could be established between Barking Park and Mayesbrook Park. In the main these follow existing designated cycle routes (e.g. the route linking The Drive with Upney Lane via Manor Road and Sandringham Road). These are densely-packed streets with limited opportunities for verge greening but the well-developed street tree stock could be reinforced (e.g. along Manor Road). A local route running north east on Longbridge Road could connect Barking Park with the Mayes Brook at the northern end of Mayesbrook Park and Goodmayes Recreation Ground and Goodmayes Park to the north. Longbridge Avenue has wide verges and a number of community green spaces adjoining housing sites on its southern fringe. This area of the borough has been identified as a surface water flood risk area and surface water swales providing flood risk attenuation could be considered within community green spaces.

Lodge Avenue   **1**

Lodge Avenue- South   **2**

Ripple Road   **3**

Ripple Road- West   **4**

Upney Lane   **5**

Upney Lane- North   **6**

Figure 7.5 Western Character Area

Gunnery Close ⑦

Harts Lane ⑧

Abbey Road ⑨

Gascoigne Road ⑩

River Road ⑪

A13 Greatfields Park ⑫

Figure 7.5 Western Character Area

7.3 Central Area

Figure 7.6 Central Area

Description

The Green Infrastructure Strategy central area is coterminous with the Becontree estate and is an area of extensive low-rise inter-war housing laid out in a combination of geometric grids, circuses and long crescents. The street grain is generously proportioned with frequent small community green spaces at road junctions. The area has a number of larger green infrastructure assets of which Parsloes Park is the most significant. This park occupies a key central position in the borough, linking the Roding Valley, Barking Park and Goodmayes in the west with the Beam Valley in the east. Parsloes also links Valence Park in the north with Castle Green, Goresbrook Park and Barking Riverside in the south. North-south connectivity is interrupted by Barking to Dagenham East railway line and the A13 road corridor.

Key issues

A key east – west linkage can be created between Goodmayes Park, Parsloes Park via Porters Avenue (a designated cycle route). Parsloes Avenue and Reed Road (also cycle routes) can provide a further link to Pondfield Park. These are wide streets with mature street tree planting and intermittent pocket green spaces (often at road junctions) offering opportunities for enhanced green infrastructure linkages.

To the south of Pondfield Park, a footbridge over the railway offers a connection to the Beam Valley via the Exeter Road allotments, Dewy Road and Manor Road, both of which could benefit from street tree planting. To the north, east west connectivity from Pondfield Park to Eastbrookend Country Park could be reinforced with a local route following Reed Road, Rainham Road and Foxlands Crescent. Green infrastructure enhancements in this area are limited somewhat by on-street parking at the highway edge.

Parsloes Park is also a point of north-south connectivity, linking St Chad's Park and Valence Park with Castle Green and Goresbrook Park. Valence Avenue and Porters Avenue (both existing cycle routes) are broad tree-lined roads offering opportunities for further street tree planting and variations to road verge maintenance. To the south of Parsloes Park, Gale Street and Amesbury Road/Vincent Road provide connection to Castle Green and Goresbrook Park respectively. Gale Street presents a range of opportunities for developing pocket green spaces and enhancing street tree provision. Opportunities on Amesbury Road/Vincent Road are compromised by street-edge parking provision.

The development of Castle Green, including the proposed tunnelling of the A13, would support a range of green infrastructure enhancement opportunities including SuDS, public realm green infrastructure, green roofs and green walls.

Green infrastructure linkages and opportunities:

- East-west green grid route (Porters Avenue/Parsloes Avenue: street tree planting, road verge management enhancements; swales and SuDS initiatives.

- Dewy Road – Manor Road: street tree planting.

- Reed Road/Rainham Road/Foxlands Crescent: intermittent reduction in on-street parking to allow for green infrastructure interventions.

- Valence Avenue – Porters Avenue: street tree planting, road verge management enhancements; swales and SuDS initiatives.

- Gale Street/Amesbury Road/Vincent Road: street tree planting, road verge management enhancements; intermittent reduction in on-street parking to allow for green infrastructure interventions.

- Castle Green: SuDS; public realm green infrastructure; green roofs/green walls.

Wood Lane

1

The Heathway

2

Wood Lane

3

Valence Road- South

4

Valence Road- North

5

Porters Avenue

6

Figure 7.7 Central Character Area

Parsloes Avenue   **(7)**

Woodward Avenue   **(8)**

Goresbrook Road   **(9)**

Dagenham Road   **(10)**
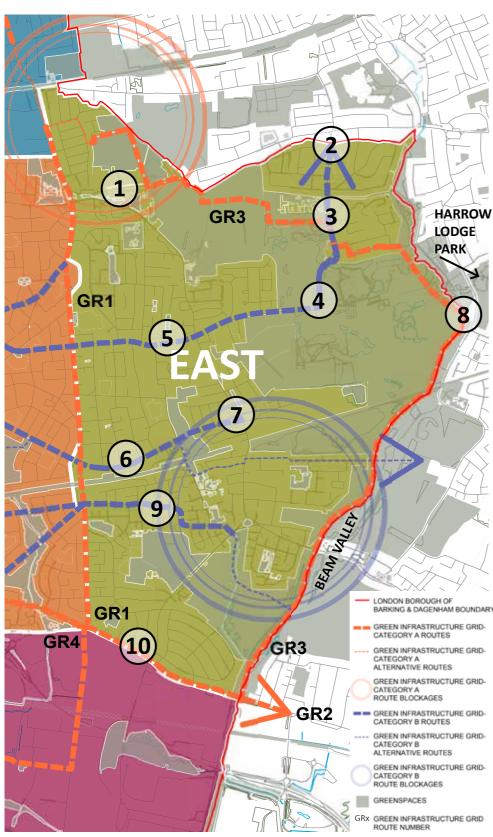
Figure 7.7 Central Character Area

Fig 7.8 Eastern Area

7.4 Eastern Area

Description

The Green Infrastructure Strategy east area combines the Dagenham East, Becontree Heath and Rush Green 'Borough Places'. This area marks the transition from the planned extensive urban development of the Becontree Estate to the sequence of public open spaces, Green Belt and SINCs that characterise the eastern boundary of the borough. The southern section of this corridor is determined by the valley of the Beam River. To the north, green infrastructure connectivity into the northern section is intermittent and becomes more closely associated with Green Belt land connecting to Hainault Forest and rural Essex. The Thames Chase Community Forest is a key linkage in this area of the borough.

Key issues

Strategic green infrastructure grid route A3 connects a sequence of large-scale green infrastructure assets along the eastern edge of the borough – Central Park, Eastbrookend Country Park, The Chase Nature Reserve and Beam Valley Country Park – connecting to the Thames at its confluence with the Beam River. Many of the spaces extend into greenspaces in Havering and green infrastructure grid route A3 connects the borough to a wider hinterland of assets including Rainham Marshes and Green Belt northwards towards Upminster.

To the north of Central Park, greenspace connectivity is most pronounced within the less built-up areas at the western edge of Havering (Crowlands Heath Golf Club, Westlands Playing Fields and the Moby Adventure Golf Centre – most of which have limited public access). Within Barking and Dagenham, a connection can be effected via Wood Lane and Rainham Road North between green grid route A3 at Central Park and the north-south route A1 defined by Whalebone Lane South. Extensive verges and pocket green spaces offer ample opportunity for supplementary tree planting and a range of biodiversity and SuDS focused interventions to enhance green infrastructure connectivity.

The western edge of this area is defined by the A1 strategic green infrastructure grid route linking SINCs and Green Belt in the north of the borough with the Leys, Goresbrook Park and eastern approaches to Parsloes Park. This route follows Whalebone Lane South/The Heathway corridor and cycle routes. These a broad avenues with considerable scope for implementing further street planting programmes, diversification of verge and pocket greenspace management and localised SuDS interventions.

As already rehearsed in the context of the green grid central area, connectivity across the centre of the borough to Parsloes Park and Mayesbrook Park is intermittent to the east of green grid route A1. Connectivity from Pondfield Park to the green infrastructure assets along the eastern fringe of the borough are impeded by railway infrastructure and narrow residential streets, many of which have been set out for road-edge parking.

A strong east-west link could be created further north, connecting The Chase Nature Reserve with Valence Lane via Dagenham Road, Oxlow Lane, Beverley Road and Wood Lane. Street tree planting is intermittent along this corridor, with a section of good quality mature street trees in the western section of Oxlow Lane. A generous road corridor at both eastern and western ends of this corridor offers opportunities for further enhancement.

The western portion of the eastern green grid area are risk areas for surface water flooding and opportunities for small scale SuDS interventions along the key green grid routes could provide attenuation and enhance green infrastructure connectivity.

Green infrastructure linkages and opportunities:

- Green Infrastructure grid route A3 - Wood Lane/Rainham Road North: street tree planting, road verge management enhancements; swales and SuDS initiatives.

- Reed Road, Rainham Road and Foxlands Crescent: intermittent reduction in on-street parking to allow for green infrastructure interventions.

- Dagenham Lane-Wood Lane: street tree planting, road verge management enhancements; swales and SuDS initiatives.

- Linkages to Thames Chase Community Forest

- Signage upgrades for cyclists in Eastbrookend Country Park

Wood Lane
1

Crow Lane to Rush Green Road
2

Central Park/Eastbrookend Country Park
3

Dagenham Lane
4

Dagenham Lane- West
5

Reede Road
6

Figure 7.9 Eastern Character Area

Rainham Road South- The Chase Nature Reserve ⑦

The Chase Nature Reserve to Harrow Lodge Park ⑧

Rainham Road- South ⑨
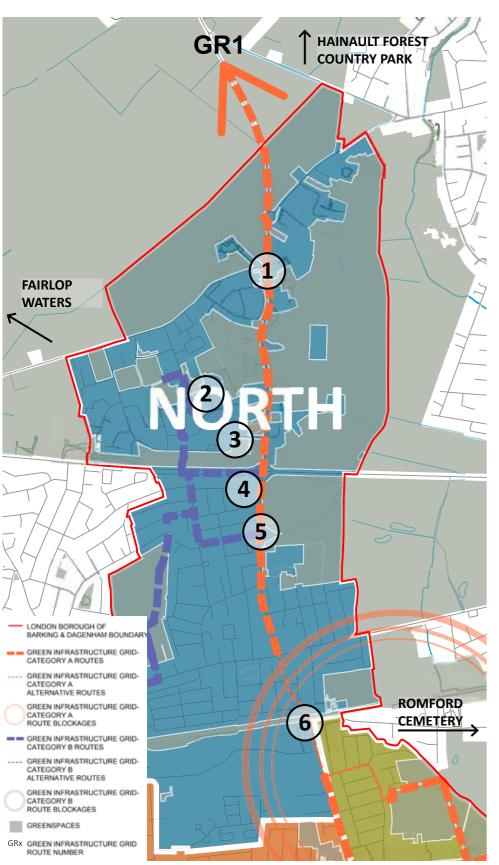

New Road ⑩

Figure 7.9 Eastern Character Area

Figure 7.10 Northern Area

Description

The Green Infrastructure Strategy north area amalgamates the Chadwell Heath and Mark's Gate 'Borough Places' and broadly marks the transition to the 'Essex Plateau' Natural Signatures area. This part of the borough characterised by low density inter-war housing, giving way to the Green Belt zone running from Fairlop Waters to Hainault Forest and beyond into Essex. A sequence of continuous SINCs and Green Belt land on both sides of the borough boundary runs southwards from Mark's Gate to Central Park. The east-west transport corridors of the A12 and the London to Shenfield railway line bifurcate the area. A Public Right Of Way runs from the Eastern Avenue (A12) through Marks Warren Farm to meet Collier Row Road.

Key issues

The strategic north south green infrastructure route GR1 connects the borough's green infrastructure assets with Green Belt land and Hainault Forest and the Redbridge Cycling Centre at Hog Hill. Within the borough boundary, the route follows Whalebone Road North and Whalebone Road South (both existing cycle lanes) connecting Furze House Farm SINC with Chadwell Heath Cemetery and Marks Warren Quarry (proposed SINCs) and sites to the south to the junction with strategic route A2 (Parsloes Park, the Leys and Goresbrook Park).

Whalebone Lane North is a generously proportioned highway with wide pavements and intermittent extensive verges and hedgerow. Opportunities exist for further street planting and adoption of new more management regimes for roadside pocket green spaces and verges. Whalebone Lane South has a more urbanistic character with less generous pavements fronting housing and commercial/retail interludes. Street tree planting is intermittent and could be reinforced.

A local connection provides a link to St Chad's Park via East Road and Portland Gardens and through the park to Valence Road via Station Road. Valence Road connects to Parsloes Park to the south and Mayesbrook and Barking Park to the south-west. At its northern end, this route runs through a grid of streets lined with low rise inter-war housing. Street tree planting is limited and opportunities exist for further installations on these roads and on Station Road to the south.

The area surrounding St Chad's Park has been identified as one of high surface water flood risk and options for addressing this could be considered. St Chad's Park offers the most obvious opportunity in this context because space on the street grid is limited.

To the south of St Chad's Park, the green grid route will connect to the Chadwell Heath regeneration site via Freshwater Road. This site offers opportunities to provide green infrastructure capacity through public realm and building design (including SuDS, green roofs and green walls).

Green infrastructure linkages and opportunities:

- Whalebone Lane North – Whalebone Lane South: street tree planting; grass verge and pocket greenspace management.

- East Road/Portland Gardens/St Chad's Park/Station Road: street tree planting; SuDS interventions (St Chad's Park).

- Chadwell Heath regeneration area: SuDS; public realm green infrastructure; green roofs/green walls.

- Chadwell Heath anti-aircraft gun emplacement signposting and interpretation

Whalebone Lane- North (1) (1)

Arneways Avenue (2)

Whalebone Road- North (2) (3)

Sheepcote Road (4)

Pemberton Gardens (5)

Whalebone Road- North (3) (6)

Figure 7.11 Northern Character Area

Well-designed Green infrastructure can deliver multiple benefits. This chapter consists of two parts:

- The design principles for green infrastructure that for the borough

- The design principles for each Character Area of the borough.

Design principles for the borough and for character areas need to be responded to in master plans, soft landscaping, transport planning and the creation of SuDS.

8.1   BOROUGH WIDE DESIGN PRINCIPLES

The design principles for different types of Green Infrastructure are set out in this section and provided the minimum design requirements expected for new green infrastructure and the upgrading of existing green infrastructure. The types of Green Infrastructure are subdivided into:

- Ecomimicry

- Active transport routes;

- Sustainable urban drainage systems;

- Trees, hedges and woodlands;

- Green corridors and wildlife corridors;

- Green roofs and green walls;

- Areas dedicated to food growing.

- Bird and bat boxes

Within each category the relevant national and regional guidance is signposted, followed by the requirements specific to Barking and Dagenham.

Each component that makes up green infrastructure has the potential to be multi-functional. However, it does not need to tick all the boxes, particularly where this may have negative impacts.

Green Infrastructure	Active travel	SuDS	Street trees	Wildlife corridors	Green roofs or walls	Food growing
Ecomimicry	X	X	X	X	X	X
Active travel	X	X	X	X		X
SuDs	X	X	X	X	X	
Trees	X	X	X	X		X
Wildlife corridors	X	X	X	X	X	X
Green roofs / walls		X		X	X	X
Food growing	X		X	X	X	X
Bird and bat boxes			X	X	X	X

Table 8.1 Green Infrastructure matrix

Opportunities to achieve a net-gain in biodiversity should be sought through development and as part of master planning, detailed design, implementation and long-term management activities. This should include both strategic and site-wide habitat creation measures as well as the provision of small scale elements (including those that can be integrated within buildings) such as green and blue roofs, bird and bat boxes, artificial roosting sites and invertebrate refuges.

The London Environment Strategy (2017) requires opportunities to be sought to create or restore priority habitats in London. Priority habitats in Barking and Dagenham include:

- Acid grassland

- Coastal and floodplain grazing marsh

- Fen, marsh and swamp

- Lowland meadows

- Open mosaic habitats on previously developed land

- Orchards

- Reedbeds

- Rivers and streams

Habitat protection and enhancement to increase biodiversity in Barking and Dagenham should include the creation and restoration of these habitats. In addition, opportunities should be identified to improve ecological networks and wildlife corridors and to make existing SINCs more resilient through buffering and strengthening connectivity.

Opportunities should also be identified to increase the biodiversity of existing open spaces including public parks, recreation areas, amenity spaces, community gardens and allotments.

The London Environment Strategy (2017) has also identified four habitat types that have wider scope for creation in London. These are set out below:

Habitat type	Description	2025 target	2050 target
Species rich woodland	New woodlands planted with native trees, shrubs and ground flora.	20 ha	200 ha
Flower-rich grassland	Include acid, chalk or meadow grasslands, and other flower rich swards.	50 ha	250 ha
Reed beds	Wetlands dominated by stands of Phragmites australis, where the water table is at or above ground level for most of the year.	5 ha	30 ha
Rivers and streams.	All free-flowing watercourses above the tidal limit, including main rivers, streams and ditches, some of which may have been culverted.	10 km	40 km

Table 8.2 Habitat creation

8
GREEN INFRASTRUCTURE AND BIODIVERSITY DESIGN PRINCIPLES

8.1.1 Ecomimicry

Ecomimicry is based on the recreation of natural or semi-natural habitats that are appropriate to a particular geographical location and should be incorporated into the design of all green infrastructure. The creation of specific habitats with a particular species composition has significantly greater value for biodiversity than generic landscaping. Making use of different substrates as part of the design increases the ecological value of the habitats created, particularly for invertebrates.

The first step in the process is to retain existing natural or semi-natural habitats wherever possible, as existing vegetation will already be adapted to local conditions and provide benefits for biodiversity. Understanding the history of the site and its location in the wider landscape will help identify which habitats should be recreated. London's Natural Landscape Signatures (2011) can assist with this process along with the Council's Biodiversity Survey (2017). Further information on applying the LNS is provided in Section 8.2.

Adopting an ecomimicry approach will help developers meet with the Local Plan policy requirements and with the London's Plan's Urban Greening Factor.

Ecomimicry for Barking Riverside (2016)[35]provides a clear explanation of the process to follow and how the principles of ecomimicry can be applied to different types of green infrastructure.

8.1.2 Active transport routes

Active transport routes include on-road cycle paths, footpaths and off-road routes for green travel.

The design principles for active transport routes in the borough should take account of the following guidance and good practice:

- Healthy Streets for London, Prioritising walking, cycling and public transport (2017)[36]

- Pedestrian Comfort Level Guidance First Edition 2010, Version 2 (2019)[37]

- Streetscape Guidance, Fourth Edition (2019)[38]

- Walking Action Plan, making London the most walkable city (2018)[39]

- Design Guidance, Active Travel (Wales) Act 2013 (2014)[40]

- Manual for Streets (2007)[41]

A walking or a cycling route is only as good as its weakest link. The design for footpaths and cycle paths needs to provide positive answers to the following questions.

- Linkages – Does the route connect to other routes?

- Directness- Is the route the most direct way to reach a particular destination?

- Width – Is the width sufficient for users to feel safe? Can people walk or cycle in groups?

- Surfaces – Is the surface well maintained, smooth and level? Is there pooling of water after heavy rain?

- Signage – Are walking and cycling routes signposted? Are walking times provided?

- Seating – Is there seating at regular intervals? Is the seating designed for comfort and well maintained?

- Greening- Has existing vegetation and trees been retained in the design? Is new planting included in the design?

- Are there opportunities to reduce or avoid littering?

- Multifunctional – Does it encourage active travel; Does it reduce surface water run off; Is there shade for pedestrians and cyclists; Are there native trees and vegetation to create wildlife corridors?

8.1.3 Sustainable Urban Drainage Systems (SuDS)

The design principles for sustainable urban drainage in the borough should take account of the following guidance and good practice:

- Barking and Dagenham Sustainable Drainage Design and Evaluation Guide (draft)

- SuDS in London – a guide (2016)[42]

- London Sustainable Drainage Action Plan (2016)[43]

- Local Flood Risk Management Strategy, LBB&D (2017)[44]

- Non-statutory technical standards for sustainable drainage systems (2015)[45]

- The SuDS Manual (2015)[46]

To increase the benefit of SuDS systems they should be designed as a network rather than stand-alone features and should provide additional habitat and biodiversity benefits. The design of SuDS systems should incorporate a variety of connected elements including:

- Swales- are structured depressions or channels within grassed or vegetated areas that may be wet or dry, collecting, storing and discharging surface water flow along a gentle gradient. Swales should limit velocities during extreme events to 1-2 m/s.; have maximum side slopes of 1 in 3 where soil conditions allow; have a base width of at least 0.5m; avoid use of underground structures; planted according to type of swale – dry or wet; use native species only; and avoid the use of fertiliser.

- Rain gardens – are shallow features that collects runoff from roofs, pavements or roads and are planted with plants that are tolerant of waterlogging for short period. The maximum depth of a rain garden should be 150mm and they should be planted with native plants of local provenance. They should be connected to other SUDs feature such as rills.

- Wetlands and ponds- vary considerably in size and provide a means to collect and store surface water generally over a longer period, providing valuable ecological habitat and amenity. They should be at the end of the SuDS management train. Wetlands can be varied in scale, according to location Open water should have a depth between 1.2m and 2m with shallower areas that have depths between 0.6m and 1.0 m; the sides should be gently sloping, with a maximum slope of 1 in 3; use native species only and consider natural colonization to void the accidental introduction of non-native species.

- Filter strips and drains- are used to capture surface water through linear grass, soil or aggregate features and direct flow to swales, bio-retention systems, wetlands and ponds. Filter strips should have a minimum width of 2.5m, a 1 percent slope and a minimum length of 1m. Maintenance will need to avoid compaction. Plant with suitable native species of local provenance.

- Blue roofs – are used to retain water within a porous substrate or within a designed void within a flat roof through a restrictive flow outlet. Blue roofs provide temporary storage of rainfall and help control the rate of runoff. They can include open water or and can be combined with intensive and extensive green roofs.

SuDS	Design	Planting	Locations
Swales	Velocities limited to 1-2 m/s; Maximum side slopes of 1 in 3; Minimum base width of 0.5m; Avoid use of underground structures.	Native plants of local provenance; / Species selection according to type of swales – wet or dry; Avoid fertiliser use.	Road verges; Communal soft landscaping; Open space.
Rain gardens	Max depth 150mm	Native plants of local provenance	Gardens; Road verges, Pavements
Wetlands and ponds	Open water areas depth between 1.2m and 2m; shallow areas with depths between 0.6m and 1.0 m; Sides maximum slope of 1 in 3; / Wetlands can be varied in scale, according to location; at end of SuDS management train.	Native plants of local provenance; / Consider naturalisation to reduce risk of introducing invasive species.	Communal soft landscaping; Open space.
Blue roofs	Combine with green roofs and photovoltaics for maximum benefits; water can be retained in basin or in substrate; water management can be used for maintenance of vegetation and cooling.	Native plants of local provenance, if planting is appropriate.;	Flat roofs.

Table 8.3 Types of SuDS

8.1.4 Trees, hedges and woodlands

Trees make a significant contribution to improving the amenity, environmental health and ecological diversity of urban areas, helping to combat climate change and reducing air pollution. A key environmental policy objective of the Mayor of London is to increase the number of trees in the capital and extend the tree canopy that is currently estimated to be around 21% of the city's land area.

Woodlands and hedgerows can make a significant contribution to amenity, biodiversity and mitigating climate change impacts. The Climate Change Committee in its report Net Zero: The UK's contribution to stopping global warming (2019) recommends increasing hedgerows by 40%. However, species selection, design and management are crucial to ensure benefits from tree planting, woodland creation and hedgerows are realized.

The design principles for street trees, trees on new development, hedges and woodlands in the borough should take account of the following guidance and good practice:

- Trees in The Townscape: A Guide for Decision Makers (2012)[47]

- Trees in Hard Landscapes: A Guide for Delivery (2014)[48]

- Woodland Trust Twigged: Guide to Native Species

- Tree Species Selection for Green Infrastructure (2019)[49]

- Woodland Trust Urban Woodland Management, including Damage and Misuse26 and Thinning and Felling[50].

- Hedgelink- a range of guides to planting and managing hedgerow is available on their web site: http://www.hedgelink.org.uk/

To maximise the benefits of trees to green infrastructure the following design requirements should be met:

1. Existing trees should be retained, and the layout of development designed to maximize retention of trees and minimize impacts of development on new and existing trees in the future.

2. Where new trees will be planted soil should be protected from compaction.

3. Trees that are native and of local provenance should be the first choice for species selection. Justification for the use of non-native trees will be needed.

4. Trees that will have a significant canopy when mature should selected to maximise environmental benefits.

5. Wherever possible grass or native plants should be planted around street trees rather than using hard surfacing. This will increase the effectiveness of mitigating climate impacts and promote amenity and biodiversity.

6. Trees should be sourced from stock grown in the UK to avoid the import of non-native invasive species.

Hedgerows are often included in soft landscape plans but fail to reach their full potential due to poor design and inappropriate management. The following guidelines should be referred to and included in any management plans:

1. All species should be native. They should be grown from indigenous root stock or seed, to ensure they are adapted to local conditions.

2. The recommended species composition is: 60 per cent mix of hawthorn and blackthorn; 40 per cent mix of other species intermixed randomly with the hawthorn and blackthorn. Suitable species include: field maple, elder, dogwood, wayfaring tree, hazel, wild cherry, guelder rose, dog rose, field rose.

3. A hedgerow should be planted in a double staggered row with at least 40cm between each row and 4-6 plants planted per metre.

4. Trees can be included in the hedgerow. Suitable trees include: oak, ash, alder, beech, field maple, wild cherry, hornbeam, rowan, crab apple and holly. Once planted use a marker stake and tree-tag to help prevent the trees being cut during hedge maintenance operations.

5. A strip of grassland at least 2m wide on either side of the newly planted hedgerow should be provided if possible. These strips should be planted with native ground flora. The use of herbicide on the grassland strips should be avoided.

6. In general, cut hedges in January or February, to avoid harm to nesting birds and to allow birds to forage during the winter months. Always avoid cutting hedges and trees between March and September.

8.1.5 Green corridors and wildlife

Green corridors and linear landscape features are recognised as particularly important green infrastructure elements. The borough has a variety of rivers, road and rail corridors, pedestrian and cycling routes and rights of way that serve as green corridors and are mapped and described within this Strategy.

Wildlife corridors are a continuous series of nature conservation sites that allow species to move between sites. They can increase the viability of populations by reducing fragmentation and isolation. Wildlife corridors in Barking and Dagenham mainly consist of:

- Main rivers and tributaries, many of which are adjacent to roads and industrial areas or traverse through industrial sites.

- The River Thames, a significant corridor for wildlife, with associated mudflats.

- The Chase and Eastbrookend Country Park and Beam Parklands SINCs form a wide wildlife corridor along the eastern side of the borough.

Opportunities to connect with existing corridors and nature conservation sites and to create new corridors should be sought by developers. The following design principles should be used in order to enhance existing wildlife corridors and create new ones:

- Wildlife corridors may require protection from disturbance and may not be suitable for active travel. Lighting infrastructure and footpaths / cycle paths should avoid traversing the naturalised buffers adjacent to waterways.

- Lighting adjacent to wildlife corridors, including waterways, and through open spaces needs to be carefully designed to avoid impacts on bats, nesting birds and invertebrates.

- Habitat creation and how it can improve connections with local wildlife corridors or SINCs needs to be incorporated into soft landscape plans on new developments.

- Opportunities to deculvert waterways and naturalise the banks of waterways should be included in development proposals that have waterways within or adjacent to the development site.

- Where continuity cannot be created, a 'stepping stones' approach should be adopted and appropriate habitats (type and size) created on and adjacent to the development site.

Policy G4 Open space in the Draft London Plan (July 2019) recognises the contribution that green spaces can make to improving wildlife corridors.

The London Environment Strategy (2018) requires new areas of habitat to be created to improve wildlife corridors and enhance habitats.

Design principles for active transport routes in the borough should take account of the following guidance on managing green corridors and greenways:

- Greenway Management Handbook (2016)[51]

Private and communal gardens can make significant contributions to green corridors. Front gardens should be designed to prevent residents converting them into car parking areas. Where parking is provided, it should be designed to minimise the amount of hard surfacing and include greenery.

The following principles can help increase the green infrastructure benefits of gardens for residents:

1. Avoid the use of artificial surfaces, including paving, decking and artificial grass.

2. Replace boundary fences with hedges.

3. If there is space include a tree or trees in the design.

4. Include native plants and shrubs to maximise benefits for biodiversity.

5. Include a pond or wetland if there is sufficient space.

6. Create 150mm gaps at the bottom of fences to allow the movement of hedgehogs or install hedgehog baffles.

7. Avoid using fencing or railings that have spikes, as these are hazardous to people and wildlife. Any fences must be wildlife friendly with

8.1.6 Green roofs and green walls

Increasing development across the borough will inevitably put greater pressure on urban green spaces. Opportunities to enhance the urban greening of buildings with green roofs and living walls should be incorporated wherever possible. The design principles for green roofs in the borough should take account of the following guidance and good practice:

- Living Roofs and Walls, Technical Report: Supporting London Plan Policy (2008)[52]

- Living Roofs and Walls, from policy to practice, 10 years of urban greening in London and beyond (2019)[53]

- The Green Roof Guide40 and Green Roof Code (2011)[54]

The design of green or living roofs and walls should meet the requirements set out below:

Type of green roof / green walls	Substrate	Planting	Special features
Biodiverse roofs (extensive)	Minimum substrate depth 100 mm Use at least 3 types of recycled aggregates across the roof. Use soil from site if it is un-contaminated.	Native herbs and sedums of local and regional provenance or allow natural colonization.	Include ephemeral and permanent wetland areas; soil mounds (75 to 200 mm); bare substrate; dead wood; rubble; bug hotels. Combine with blue and / or photovoltaic roofs.
Semi Intensive green roofs	Minimum substrate depth: 100 mm Use at least 3 types of recycled aggregates across the roof.	Native herbs, shrubs and sedums of local and regional provenance	Ephemeral wet areas; permanent wetland areas; mounding of soil (75 to 200 mm); areas of bare substrate; deadwood piles; rubble piles; bug hotels.
Roof garden (intensive)	Minimum substrate depth: 200 mm Use at least 3 types of recycled aggregates across the roof for biodiversity. Use suitable planting medium for shrubs, vegetables, trees etc	% of native and non-native species dependent on location. native herbs and sedums of local and regional provenance. Ornamental species with value for biodiversity.	At least 70% of the roof garden must be covered by vegetation, or vegetation and water. Artificial surfaces will not contribute to the UGF.
Extensive sedum roofs	Minimum substrate depth: 80mm. Substrate type: as specified by manufacturer.	Mix of sedum species.	Only suitable for structures that cannot bear weight of intensives or extensive roofs.
Green walls – living wall systems	Living wall system: Use plant cells or pockets. Modules or sheets, attached to wall.	Ornamental plants attractive to pollinators, native plants, grasses, ferns, sedges, herbs and salad plants can all be grown depending on the design intentions for wall.	Nest boxes / bug boxes.
Green wall – direct or indirect greening	Climbers planted directly into soil. Direct greening: use self attaching climbers. Indirect greening: use support for climbers such as trellis or wires.	For biodiversity select native climbers: Helix hedera (native ivy); Clematis vitalba (Old Man's Beard); Lonicera periclymenum (native honeysuckle).	Nest boxes / bug boxes.

Table 8.4 Green roof and wall requirements

8.1.7 Food growing

The provision of opportunities for food growing support the development of a healthier food environment and supports a range of physical and mental health outcomes. The London Plan (2017, policy G8)[55] details the link between local food growing initiatives and the Mayor's Food Strategy and there are a number of partnerships, contributing to the development of a vibrant food growing sector across the borough. Barking and Dagenham has 17 traditional allotment sites and these provide the significant opportunities for food growing by local residents.

Further opportunities to expand food growing will result from the development of the 'amenity greenspace' policy being prepared by the borough.

The design principles for food growing in the borough should take account of the following guidance and good practice:

- Cultivating the Capital, Food growing and the planning system in London (2010)[56]
- The Urban Farming Toolkit (2017) [57] and Food Growing in Parks (2018)[58]
- Food Growing Guidance, Greenspace Scotland[59]

Food growing space can be provided in a number of ways on and near development sites. The following list is in order of preference:

1. Providing specific areas for communal food growing at ground level within the development site. Larger areas of communal external space that are traditionally landscaped as amenity grass can be used for food growing plots. Where space is more limited or where there are issues of soil contamination, raised beds can be created. Raised beds also make food growing more accessible for people with disabilities.

2. Providing a small orchard of fruit trees that can be harvested by residents.

3. Roof gardens or intensive green roofs are designed to allow access by residents. Such roofs are designed to bear a heavier load and can support a variety of vegetation and even trees. These roofs should aim for 70% coverage of the roof garden with vegetation or soil.

4. Private amenity space can be designed to incorporate raised beds. The raised bed can have soil purposely enriched for vegetable growing.

5. Incorporating Edible Landscaping (ornamental plants or trees that also produce edible fruits or nuts) into landscaped areas that are easily accessible to residents for harvesting and that are protected from potential contamination.

6. Green walls: Walls can be used for vertical growing of plants for food production. They need to incorporate feeding and irrigation and are particularly useful for growing salads, herbs and tomatoes. They will need to be accessible, so that produce can be harvested and may require a dormant period in the winter.

7. Internal atriums and courtyards: Buildings with internal communal space such as courtyards or atriums can support food growing if there is sufficient sunlight. They are particularly useful for crops that benefit from extra protections such as peppers, aubergines, melons and citrus fruit.

8. Balconies: Balconies can be designed to incorporate small spaces for food growing, depending on aspect. Window boxes can be incorporated into the design of balconies. The loading aspect should be considered at the design stage.

Management of communal food growing spaces

Communal food growing areas will need to have a management strategy to ensure they do not fall into disuse and become unsightly. It is recommended that:

1. The landscape maintenance plan specifically includes liaison with residents and assistance with management of communal food growing areas.

2. New residents are provided with an information pack which includes:

- Information about the communal and private food growing areas;
- Contact details for local horticultural and / or allotment societies;
- 1 year membership of a local horticultural or allotment society or 1 year membership of an organisation such as the Royal Horticultural Society or Garden Organic.
- A set of basic gardening hand tools (hand trowel and hand fork).

Technical issues

Designing food growing opportunities into a new development requires consideration of a number of technical issues:

Position: Most plants grown for food grow best in a sunny position. If light is restricted, the types of crops that can be grown are also restricted. If plants can be sheltered from cold and strong winds, this will be beneficial. It is a good idea to position food growing areas away from trees and hedges if possible.

Water: Water butts or access to mains water should be within 6m of any food growing areas. Regular watering is needed for crops to be productive. For communal food growing areas, it will be necessary to design this into the scheme. Capturing rain water and the use of water butts can help keep water use sustainable.

Soil: Soil depth should be a minimum of 18 inches. Plants grown for food require soil that is aerated and rich in organic matter. Without these conditions, they are unlikely to be productive. Construction on a site will usually leave soil compacted and prone to water logging after heavy rain. Sufficient measures need to be taken to avoid compaction or to remediate it following construction. Top soil may be needed and the addition of organic mulches (well-rotted manure, compost, leafmould, composted bark, mushroom compost) to provide a good structure for the soil. The use of peat or peat based products must be avoided.

Contaminated land: The site should be assessed to determine if the soil is contaminated. Where contamination prevents food growing directly in the ground, raised beds can be used (separated from the ground by a suitable membrane). Toxic materials, such as pressure treated wood, should not be used where they will come into contact with soils that are growing food.

Raised beds: These should be 615mm high for wheelchair access; 500mm wide where there is access only on one side; up to 1000mm wide for a bed with access on both sides[60].

Compost: Gardening will produce waste plant material and this should be composed on site. Composting facilities should be designed into the development from the outset.

Sustain, the alliance for better food and farming, has published a variety of useful technical and good practice guides on urban food growing. These include a Guide to Wildlife Friendly Food Growing and the East London Green Grid: Supporting

community food growing in East London47. The most recently published guidance focuses on Food Growing in Parks, that provides a number of different options for working with local communities to grow food in public parks.[61]

8.1.8   Bird and bat boxes

Providing nesting and roosting boxes can further enhance the benefits of green infrastructure for biodiversity. Opportunities can be provided in modern buildings by incorporating specially designed bird and bat bricks into the building's walls and into the roof space. This is preferable to attaching bird and bat boxes to buildings, as internal cavities are more attractive to birds such as house sparrows and to bats, provide more protection and are less obtrusive.

1. The new development should incorporate a range of artificial nest and roost sites, with the number reflecting the size and scale of the development.

2. Features such as bird bricks and internal bat roosts should be designed into the structure of the buildings and should be shown on the soft or hard landscaping plan.

3. These features should be specific to the species that occur or are likely to occur in the area. They are likely to include house sparrows; starlings; house martins; swifts; black redstarts; bats.

4. Provide these features beneath the eaves of the building if possible, as these locations are preferred by birds.

5. All tall buildings should incorporate a row of swift bricks one or two rows below the eaves of the buildings.

6. The direction that bird boxes or bricks face is very important. In general avoid south or south-west facing walls, as fledglings will over heat.

7. Provide additional bird and bat boxes on suitable trees. External bird and bat boxes should be made of long lasting material, such as woodcrete.[62]

8.2 CHARACTER AREA DESIGN CODES

New development should apply the Design Codes detailed in this section to soft landscaping, green infrastructure and habitat creation for the Character Area in which their development falls. The Character Areas are defined in the Barking and Dagenham Townscape and Socio-economic Characterisation Study and a map is provided in Appendix 4.

The Design Codes have been created by overlaying London Natural Signatures with the Character Areas to provide specific recommendations for each area.

London Natural Signatures provides an analysis of landscapes and associated habitats across London and guidelines on how these can inform soft landscape design. There are 4 different natural signatures within the borough and the table below shows the character areas that fall into each LNS category.

8.2.1   Applying the LNS to soft landscape design

Detailed information is provided below for each LNS with information on the LNS, soft landscape interpretation and preferred habitat types. The key species that are associated with major habitat types are also provided.

Developers should base masterplans, soft landscape plans and design codes on the information provided in the relevant tables below. Note that where a development site is adjacent or within 200m of a SINC, the habitats present on the SINC should inform the soft landscaping of the proposed development.

In addition, a list of native plants, shrubs and trees of local provenance to Barking and Dagenham can be found in Appendix 3.

Step 1: Identify the Character Area the development site is in (refer to Appendix 4);

Step 2: Identify the relevant London Natural signature;

Step 3: Are there any SINCs within 200m of the development site?

Step 4: Are there any physical connections between the development site and green infrastructure outside the site boundary?

Step 5: Select the habitats in the tables below to include within the soft landscape design and to meet with the UGF.

Step 6: Select the appropriate species composition for the selected habitat. Ensure species selected are native and are not cultivars.

Step 7: Where specific habitats are not created, refer to Appendix 3 for appropriate species selection.

London Natural Signature	Character areas
LNS 7 Essex Plateau	Marks Gate Chadwell Heath (between A12 and Chadwell Heath Station)
LNS 8 Roding Valley	Barking Town Centre (east of Abbey Green and Gascoigne Estate)
LNS 9 North Thames Terraces	Chadwell Heath (south of Chadwell Heath Station) Becontree Dagenham East Rush Green Faircross, Leftley and Upney Barking Town Centre (west of Abbey Green and Gascoigne Estate, down to A13)
LNS14 Lower Thames Floodplain	Barking Riverside and Thames View Dagenham Riverside

Table 8.5 Character area design codes

LNS 7 ESSEX PLATEAU

Character Areas

- Marks Gate

- Chadwell Heath (between A12 and Chadwell Heath Station)

Environmental assets

SINC	Key features
Furze House Farm	Arable fields; Hedgerows, dominated by Hawthorn (Crataegus monogyna) with some young oak (Quercus robur); Breeding birds species of conservation concern; Wintering golden plovers.
Padnall Lake	Amenity grassland; Scattered trees; Scrub; Semi-improved neutral grassland, Lake/pond; Wooded island; Willow, alder; Marginal vegetation;, Orchard; Breeding water fowl.
Marks-Warren Quarry	Semi-improved neutral grassland; Native hedges; Crataegus monogyna; Quercus robur; Swallows, house sparrows and skylarks.
Cranfield Golf Course	Semi-improved neutral grassland; Scattered trees; Tall ruderal; Mature trees and shrubs, include Fraxinus excelsior, Prunus spinosa, Quercus robur and Prunus avium.
Marks Hedge	Ancient hedge and ancient woodland through Marks Warren Quarry and Cranfield Golf Course; Hedge accompanied by a ditch and earth bank; In Cranfield Golf course, woodland species include Quercus robur, Carpinus betulus, Ulmus sp., Hazel (Corylus avellana) and Crataegus monogyna; In Marks Warren Farm, species include Acer campestre, Prunus spinosa, Salix cinereal and S. caprea)., characteristic of the Medieval period.
St Chads Park	Amenity grassland, Hedge, Planted shrubbery, Scattered trees, Semi-improved neutral grassland

Table 8.6 LNS 7 Essex Plateau environmental assets

Design Code

Natural Signature	Soft landscape interpretation	Habitat types to include	Key Species
- Mosaics of ancient woodland and acid grassland.	- Blocks of native woodland, linked by lines of trees, to provide a wooded backdrop to development.	Native woodland	**Woodland**
- Hornbeam coppice.	- Woodland framework for open spaces, with trees around the edges and open glades within the centre.	Woodland pasture	**Major species:**
- Ridgetop woodlands.	- Blocks of hornbeam coppice, using traditional management techniques.	Native hedge	- Quercus robur;
- Historic wood pasture.	- Woodland adventure play.	Acid grassland	**Minor species:**
- Sinuous streams bordered by alder woodland	- Multi-stem trees at gateways and focal points in / adjacent to development.	Still water	- Carpinus betulus (traditionally coppiced);
- Farmland, with small pockets of native woodland	- Open meadows against backdrop of woodland.	Running water	- Corylus avellane;
- Open character	- Link new woodland planting to existing woodlands	Ditch	- Populus tremula
		Wet marginal vegetation	- Crataegus monogyna;
			- Ilex aquifolium;
			- Sorbus aucuparia;
			- Malus Sylvestris;
			- Prunus avium;
			- Acer campestre;
			- Salix cinerea;
			- Salix caprea;
			- Ulmus sp.
			Acid grassland
			Major species:
			- Agrostis capillaris
			- Rumex acetosella
			- Festuca rubra

Table 8.6 LNS 7 Essex Plateau design code

LNS 8 Roding Valley

Character Areas

- Barking Town Centre (east of Abbey Green and Gascoigne Estate and down to River Thames).
- Barking Riverside and Thames View (Roding valley and Barking Creek)

Environmental Assets

SINC	Key features
River Roding in Barking	Semi-tidal; Exposed mud-flats at low tide; good diversity of fish; Extensive fringes of reeds; nesting reed warbler; kingfishers migrant ducks and waders.
River Thames & Tidal Tributaries	Lower River Roding and Barking Creek; Extensive reed beds; Mud-flats; Shingle beach; Inter-tidal vegetation; Freshwater, estuarine and marine communities; Wildfowl and wading birds; Black redstart; Good diversity of fish; Fish nurseries,
Gascoigne Road Pumping Station Rough	Semi-improved neutral grassland; Tall herbs; Scrub; Good diversity of common birds and invertebrates; Speckled wood butterfly; Kestrels; Important link in the Mayes Brook and associated watercourses to Barking Creek (River Thames and its tidal tributaries) wildlife corridor.

Table 8.8 LNS 8 Roding Valley environmental assets

Design Code

Natural Signature	Soft landscape interpretation	Habitat types to include	Key species
Upper Roding - Farmland alongside the riverbanks. - Lines of willow trees marking the alignment of the stream. **Lower Roding** - Mudflats and reedswamp on the wider floodplain of Lower Roding.	- Wetlands as a focus for new development – open water and wetlands as part of flood attenuation areas. - Curving swales, with reeds and damp grassland within and on edges of roads, foot paths and car parks, and as gateway features. - Boardwalks and decks jutting out onto wetland areas. - Interconnected wetlands alongside roads, with reedbeds where possible.	- Native woodland - Reed bed - Rough grassland - Native hedge - Still water - Ditch - Running water - Wet marginal vegetation	**Trees** **Major species:** - Salix cinerea; - Salix. caprea **Minor species:** - Quercus robur; - Populus tremula; - Betula pendula; - Crataegus monogyna; - Ilex aquifolium; - Sorbus aucuparia; - Malus Sylvestris; - Prunus avium; - Acer campestre; - Ulmus sp. **Reedbed** **Major species:** - Phragmites australis;

Table 8.6 LNS 7 Rosing Valley design code

LNS 9 North Thames Terraces

Character Areas

- Chadwell Heath (south of Chadwell Heath Station)
- Becontree
- Dagenham East
- Rush Green
- Faircross, Leftley and Upney
- Barking Town Centre (west of Abbey Green and Gascoigne Estate, down to A13)

Environmental assets

SINC	Key features
Mayesbrook Park Woodland and Floodplain	Acid grassland, Native hedge, Scattered trees, Secondary woodland, Semi-improved neutral grassland, Standing water, Running water, Tall herbs, Reed bed
Mayes Brook and associated watercourses	Marsh/swamp, Running water, Semi-improved neutral grassland, Wet ditches
Parsloes Park	Pond/lake, Secondary woodland, Semi-improved neutral grassland, Native hedge, Scattered trees
Barking Park and Loxford Water	Amenity grassland, Pond/lake, Running water, Scattered trees, Semi improved neutral grassland, Tall herbs
The Chase and Eastbrookend Country Park	Acid grassland, Marsh/swamp, Pond/lake, Running water, Scrub, Secondary woodland, Semi-improved neutral grassland, Wet grassland
Beam Valley	Acid grassland, Reed beds, Marsh/swamp, Open mosaic habitat, Pond/lake, Roughland, Running water, Scattered trees, Scrub, Semi-improved neutral grassland, Wet woodland/carr
Dagenham Breach and the lower Beam River in Dagenham	Pond/lake, Reed bed, Running water, Scrub, Semi-improved neutral grassland, Tall herbs
Wantz Lake	Hedge, Pond/lake, Running water, Scattered trees, Scrub, Semi-improved neutral grassland, Tall herbs
Romford Line Railsides in Barking & Dagenham	Scrub, Secondary woodland, Semi-improved neutral grassland

Table 8.10 LNS 9 North Thames Terrace environmental assets

Design code

Natural Signature	Soft landscape interpretation	Habitat types to include	Key species
- Open acid grassland (occasional stands of heather) - Open farmland with hedgerow trees and small copses – some field ponds. - River Ingrebourne corridor – sinuous stream, with narrow floodplain meadow and strips of native woodland. - Local bricks as materials for built development. - Subtle 'step up' in landform, from alluvial floodplain of River Thames to terraces to the north. - Contrast between narrow strips of woodland along tributary creeks and completely open acid grassland. - Black poplar. - Flooded gravel quarries.	- Steps and subtle terraces as a focus for design. - Isolated clumps and winding lines of trees within a relatively open meadow setting. **Eastern stretch** - Open acid grassland and wildflower meadows. - Black poplar (local provenance) planted as features within large scale open spaces, associated with wetland scrapes.	- Open acid grassland - Open farmland with hedgerow trees, small copses and field ponds. - Narrow strips of woodland along tributary creeks - Black poplar. - Flooded gravel quarries	**Woodland** **Major species:** - Populus nigra; **Minor species** - Quercus robur; - Populus tremula; - Fraxinus excelsior; - Crataegus monogyna; - Sorbus aucuparia; - Acer campestre; - Salix cinerea; - Salix caprea; - Salix fragilis; - Ulmus sp. **Acid grassland** **Major species:** - Agrostis capillaris - Rumex acetosella - Festuca rubra

Table 8.11 LNS 9 North Thames Terrace design code

LNS 14 Lower Thames Floodplain

Character Areas:

- Barking Riverside and Thames View

- Dagenham Riverside

Environmental assets

SINC	Key features
Ripple Nature Reserve	Reed bed, Ruderal, Secondary woodland, Semi-improved neutral grassland, Tall herbs, Wet ditches
Buzzards-mouth Creek and Thames View Ditch	Planted shrubbery, Reedswamp, Scattered trees, Scrub, Semi-improved neutral grassland, Standing water, Tall herbs
River Thames and tidal tributaries	Intertidal, Marsh/swamp, Pond/Lake, Reed bed, Running water, Saltmarsh, Secondary woodland, Vegetated wall/tombstones, Wet ditches, Wet grassland, Wet woodland/carr
Gores Brook and Ship & Shovel Sewer	Marsh/swamp, Reed beds, Running water, Tall herbs, Wet ditches
Dagenham Breach and the lower Beam River in Dagenham	Pond/lake, Reed bed, Running water, Scrub, Semi-improved neutral grassland, Tall herbs
Scratton's Farm Ecopark	Scattered trees, Scrub, Semi-improved neutral grassland, Tall herbs, Wet ditches

Table 8.12 LNS 14 Lower Thames Floodplain environmental assets

Design code

Natural Signature	Soft landscape interpretation	Habitat types to include	Key species
• Flat, expansive landscape, with low horizons.	• Drainage ditches to control patterns of circulation.	• Salt marsh	**Reedbed**
• Remote and wild.	• Embankments, stepped terraces and viewing mounds..	• Mud flats	**Major species**
• Open grazed saltmarshes with networks of medieval and modern reed-fringed drainage ditches	• Open landscapes – occasional lines and groups of trees.	• Reedswamp	• Phragmites australis;
		• Wet marginal vegetation	**Woodland**
• Extensive intertidal mudflats, divided by winding creeks.	• No hedgerows, fences or upstanding boundaries.	• Ponds	**Major species**
• Reedswamp	• Wet scrapes, ponds, swales and ditches surrounded by open wet grasslands.	• Ditches	• Betula pendula
• Industrial and military heritage		• Running water	**Open mosaic habitats**
• Almost no trees.	• Incorporate industrial archaeology within the public realm.	• Grassland	See Ecomimicry for Barking Riverside (2016)[54].
		• Tree lines	
		• Open mosaic habitats:	
		• Open grassland, flower-rich grassland, scrub, secondary woodland, ephemeral water bodies.	

Table 8.12 LNS 14 Lower Thames Floodplain design code

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The implementation of green infrastructure can vary considerably across the UK due to a number of factors. These include:

- Inconsistency in respect of best practice;

- Proposed interventions not responding to local context;

- Green infrastructure elements being considered in isolation rather than as part of a network;

- A failure to prioritise green infrastructure over other design elements;

- A lack of enforcement of green infrastructure standards throughout the development process;

- Inadequate funding of green infrastructure stewardship.

Section 9 addresses the policy interventions and delivery mechanisms that can be used to ensure that high quality green infrastructure is implemented.   In combination with Section 8 which sets out green Infrastructure and biodiversity design principles, this will help ensure development delivers good quality, inter-connected green infrastructure and biodiversity interventions that are sustained through effective, sufficiently resourced and funded future stewardship.

9.1   GREEN INFRASTRUCTURE DELIVERY

Section 9 of the strategy sets out a number of objectives for green infrastructure projects for the borough. These are summarised in the Table below . At the same time the Council is monitoring and where possible, implementing green infrastructure projects identified in Area Frameworks 2 and 3 of the All London Green Grid (2012). The ALGG is currently in the process of being revised and this strategy will help inform the new ALGG.

The council is also actively exploring how to develop green infrastructure projects by extending its cycling and walking network and through initiatives such as its 'Community Spaces' programme. The council's partners across a number of sectors (e.g. Thames Chase Community Trust, the 'Land of the Fanns' Partnership) continue to develop new green infrastructure project opportunities beyond those set out in the All London Green Grid projects lists for Areas 2 and 3.

If all of these actions are pursued and new projects developed as described above, the objectives of the Green Infrastructure Strategy can be delivered in a coordinated manner over the long-term.

Green grid sub area	Project
South	• Barking Riverside; Pylon Park, public realm, Thames frontage and ecomimicry projects • Chequers Lane/Choats Lane; street tree planting and verge planting/ maintenance • River Road; street tree planting • Bastable Avenue; modified grass verge management • Longbridge Road; greening of verges and 'Fishtail' roundabout • A new green link to Wanstead Flats via the Roding Valley • Opening of/greening of industrial frontages onto the Thames and the Roding
West	• Roding Valley/Abbey Road; street tree planting and community greenspace development • A13/NCR13; adapted road verge management regimes and tree planting at junctions • Mayesbrook Park to Barking Park; street tree planting and changes to roadside verge management • Barking Park to Mayesbrook Park and Goodmayes Recreation Ground; street tree planting, road verge enhancement, community greenspace development, swales and SuDS initiatives
Central	• East-west green grid route (Parsloes/Parsloes Avenue); street tree planting, road verge enhancement, swales and SuDS initiatives • Dewy Road/Manor Road; street tree planting • Valence Road-Porters Avenue; street tree planting, road verge enhancement, swales and SuDS initiatives • Gale Street/Amesbury Road/Vincent Road; street tree planting, road verge enhancement, reduction in on-street parking • Castle Green; SuDS, public realm green infrastructure, green roofs/green walls • De-culverting the Gores Brook in Parsloes Park
East	• Route GR3 – Wood Lane/Rainham Road North; street tree planting, road verge enhancement, swales and SuDS initiatives • Reed Road, Rainham Road and Foxlands Crescent; intermittent reduction in street parking • Dagenham Lane/Wood Lane; road verge enhancement, swales and SuDS initiatives • Linkages to Thames Chase Community Forest • Upgrading/signposting of route through Eastbrookend Country Park
North	• Whalebone Lane North-Whalebone Lane South; street tree planting, road verge enhancements, pocket greenspace management • East Road/Portland Gardens/St Chad's Park/Station Road; street tree planting, SuDS interventions • Chadwell Heath Regeneration Area; SuDS, public realm green infrastructure, green roofs/green walls

Table 9.1 Green grid sub area projects

MEETING THE OBJECTIVES OF THE STRATEGY

9.2   DELIVERY MECHANISMS

Three principal factors will influence the delivery of the Green Infrastructure Strategy:

- Planning policy
- Funding
- Partnership working

9.2.1   Planning policy

The Green Infrastructure and Biodiversity Strategy provides a robust evidence base to support existing planning policies and to guide the development of new ones. Local Plan policies and design principles for green infrastructure and biodiversity should ensure the following policy objectives are achieved by proactively planning and designing natural capital resources across the borough to:

- Promote a sense of place;
- Promote economic growth and investment;
- Promote health and well-being benefits;
- Promote urban greening and climate change resilience; and,
- Masterplanning green grids and linkages.

These recommendations can inform the development of policies that should be embedded within the Local Plan (2019- 34) and support the council's four corporate priorities:

- A new kind of council
- Empowering people
- Inclusive growth
- Citizenship and participation

It is recommended that relevant policies in the new Local Plan (2019 – 2034) adopt the following principles:

- Recognize that different policy areas can achieves far more when integrated than achieving greater gain when they are not considered in isolation. For example combining active travel with increased tree planting and SuDS will achieve multiple benefits.

- The protection and retention of existing green infrastructure – recreating green infrastructure is difficult (sometimes impossible), costly and can take a significant amount of time. It is better to retain existing habitats, trees and other green infrastructure wherever possible.

- Ensure the design principles in Section 8 are adopted and implemented for developments sites and in masterplans

The importance of access to open space and to nature for physical and mental health. Designing soft landscaping so that it can provide food, benefit biodiversity and reduce climate change impacts will help meet these objectives.

- Minimise artificial surfaces in order to maximise the reduction in surface water runoff and the temperature moderating effects of vegetation.

- The opportunity to ensure the Urban Greening Factor proposed in the draft London Plan (July 2019) is implemented and achieves significant increases in green infrastructure.

- New development, and new projects outside of development sites, provide significant opportunities to enhance biodiversity and help nature recover from urban degradation and neglect.

- Recognise the significant negative impact human activities can have on the natural environment in terms of disturbance, litter and uses of plastic in soft landscaping and seek to minimize and eliminate these impacts wherever possible.

9.2.2 Funding

At a time when local authority resources are under significant pressure, new and innovative approaches to funding from a variety of sources needs to be considered. The council's Parks and Open Spaces Strategy examines alternative approaches to funding the future management of the council's green infrastructure assets. Unless a different approach to green infrastructure management is adopted by the council, the development process is likely to remain the principal source of funding for green infrastructure and biodiversity enhancement projects.

9.2.2.1   Section 106 and Community Interest Levy (CIL)

Planning gain is likely to remain a principal source of funding for green infrastructure projects and a means of delivering through the development control process, the council's open space standards both in terms of the quantum and typology of provision and the designed quality of provision in respect of green infrastructure and biodiversity. Section 106 agreements can also include a requirement for adequate funding and organisational resourcing of future management and stewardship. Barking Riverside, Castle Green and evidence the council's commitment to delivering strategic green infrastructure and biodiversity enhancement through the planning process.

9.2.2.2   Local authority capital and revenue programmes

The council will continue to invest its own funds or external funds allocated to it (e.g. LIP and GLA funding) to enhance green infrastructure and biodiversity connectivity and resilience.

9.2.2.3   External funding

The council has a good record of accessing external funding to promote green infrastructure development. Current and potential funding partners include:

- Lottery Funds
- Landfill Communities Fund
- Third Sector funds secured through funding partners such as Groundwork, the RSPB, the Woodland Trust and the Wildlife Trusts
- Charitable trusts and foundations
- Community investment initiatives – e.g. community woodlands

9.2.3   Capacity and skills/partnership working

Barking and Dagenham Council already has established relationships with a variety of external organisation partners that are delivering green infrastructure and biodiversity enhancement projects across the borough. The most significant of these partners are as follows:

- The Thames Chase Community Trust, which promotes the development of the Community Forest through green infrastructure initiatives on former brownfield and industrial land across the borough.

- The 'Land of the Fanns' partnership, which promotes and conserves the distinctive landscape qualities of south-west Essex.

- The Roding, Beam and Ingrebourne Catchment Partnership, which is working at a local level to enhance water quality and biodiversity and to increase access to these key waterways.

- Growing Communities, who produce over 5 tonnes of organic vegetables every year from their base in Central Park.

- Every One Every Day who have developed 6 'open corners' and have planted 12 'open orchards' across the borough.

Through these partnerships additional external resources can be brought in to deliver green infrastructure and biodiversity enhancement projects. Many of these projects are physically delivered by users and stakeholders, delivering the council's partnership strategic objectives of 'empowering people', 'inclusive growth' and 'citizenship and participation.

9.2.4   Monitoring the green infrastructure baseline and periodic green infrastructure audits

Sections 5 and 6 of the strategy set out the components of a green infrastructure network for Barking and Dagenham. A developing green infrastructure network will include to steps the monitor the following:

- Uncompleted green infrastructure projects from the All London Green Grid area 2 and 3
- New green infrastructure projects emerging from the All London Green Grid review
- Green infrastructure initiatives planned by the London Borough of Barking and Dagenham
- Green infrastructure projects delivered by the council's development partners
- Green infrastructure projects delivered by the council's third sector partners
- The incorporation of Section 8's principles in masterplanning and on new developments.
- The implementation of management plans for ecology and soft landscaping on new development.

Section 1.2.3 suggests that the building of green infrastructure capacity and future stewardship of green infrastructure assets can be inconsistent if not embedded in policy and adequately monitored.

To address this risk and to ensure to continuous delivery of the strategy objectives, the council should form and lead a Green Infrastructure Partnership Board to monitor the delivery of this strategy. The Board should be chaired by the Cabinet Member for environment and should include the following membership:

- Council officers from Planning, Regeneration and Parks and Open Spaces
- Representative from the Barking Riverside Community Interest Company
- Representatives from Barking and Dagenham Community Forums
- Representatives from Thames Chase Community Trust
- Representatives from the Land of the Fanns Partnership
- Representatives from the London Wildlife Trust and Essex Wildlife Trust

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APPENDICES