ROCHFORD DISTRICT COUNCIL

ENVIRONMENTAL CAPACITY STUDY

October 2015

enfusion

Rochford District Council

Environmental Capacity Study

date:	*April 2015 Final Report* *October 2015 Final Report revised to take account of representations*	
prepared for:	*Rochford District Council*	
prepared by:	*Cheryl Beattie* *Barbara Carroll* *Alastair Peattie* *Ilya Sparkes-Santos*	*Enfusion* *Enfusion* *Enfusion* *NPA GIS*
quality assurance:	*Barbara Carroll*	*Enfusion*

enfusion
environmental planning and management for sustainability

Treenwood House
Rowden Lane
Bradford on Avon
BA15 2AU
t: 01225 867112
www.enfusion.co.uk

CONTENTS

Diagrams

Figures

1.0 INTRODUCTION & PURPOSE

Purpose of the Study

1.1 Rochford District is a predominantly rural area in South East Essex and subject to significant levels of demand for additional development. However, the District is also subject to significant physical constraints to development, including areas at risk of flooding and areas protected for their international biodiversity importance. Rochford Council is required to produce an early review of the District's Core Strategy[1] (adopted December 2011) and needs to ascertain the environmental capacity for additional development in the District.

1.2 Rochford District Council commissioned Enfusion Ltd, an independent environmental planning and sustainability consultancy, to undertake a study to investigate the capacity of the environment to accommodate development additional to that set out in the adopted Rochford Core Strategy. Environmental boundaries do not correlate with administrative boundaries and the study considers the capacity of environmental factors within the Rochford District area with regard to cumulative and in-combination effects arising from potential development proposals in neighbouring areas. The purpose of the study is to provide information to help decision-making on additional housing requirements in the Rochford area.

Policy Context

1.3 The purpose of the planning system is to contribute to the achievement of sustainable development. The National Planning Policy Framework[2] (paragraph 7) states that:

"*There are three dimensions to sustainable development - economic, social and environmental - which give rise to the need for the planning system to perform a number of roles*".

These roles include meeting the needs (employment, housing and infrastructure) of the District as well as protecting and enhancing the environment. The NPPF (paragraph 8) states that:

"*These roles should not be undertaken in isolation because they are mutually dependent*".

1.4 The Council understands that in trying to meet the future needs of people within the District it is vital to have an understanding of the capacity of the receiving environment to accommodate growth. Without this, it would be difficult to protect and ensure the future integrity of the environment in order to provide sustainable development as required in the NPPF.

[1] http://www.rochford.gov.uk/planning/policy/local_development_framework/core_strategy_dpd1
[2] https://www.gov.uk/government/publications/national-planning-policy-framework--2

1.5 The adopted Core Strategy (December 2011) addresses the location of housing provision to 2025. Rochford District was required by the East of England Plan to accommodate 3,790 dwellings between 2006 and 2021, at an approximate average of 250 dwellings per year. Post 2021, the District was required to continue the development rate of 250 dwellings per year. Policies H1-7 guide the delivery of housing and associated infrastructure. Policies CP1-3 guide design of development and protection of heritage assets; Policies ENV 1-11 seek to protect and enhance environmental factors.

1.6 The Allocations Plan[3] (adopted February 2014) sets out how land is allocated across the District for a range of uses. This includes boundary allocations relating to the town centres of Rochford (submitted for examination November 2013), Hockley (adopted February 2014) and Rayleigh (–submitted for examination December 2014). Detailed land allocations for these three town centres as well as London Southend Airport and Environs (adopted December 2014) are addressed in separate Area Action Plans (AAPs.)

1.7 The Council is committed to preparing an early review of the Core Strategy, ensuring that the plan period covers at least the next 15 years. As part of the updated evidence base, a fundamental review of the Strategic Housing Market Assessment[4] (SHMA, December 2013) was produced for the Thames Gateway South Essex (comprising the areas of Basildon District, Castle Point Borough, Rochford District, Southend Borough, and Thurrock Borough Councils). A further review of the SHMA to take account of the most up to date guidance is being prepared to inform the early review of the Core Strategy, and in particular the Objectively Assessed Need for the district, in line with the NPPF.

1.8 The Joint SHMA (December 2013) identifies a housing need within the sub-region of Thames Gateway South Essex of 2,800 dwellings per year until 2031. This includes 240 dwellings specifically for Rochford District, equating to some 1,440 dwellings for the period 2026 to 2031, although has noted above, the SHMA is subject to review. The duty to cooperate in the Localism Act[5] (2011) places a legal duty on local planning authorities to cooperate on strategic cross boundary matters before they submit their Local Plans for examination. Rochford Council is particularly mindful of the potential for in-combination effects of any new proposals for Rochford District with those proposed in neighbouring areas. It is possible that the total housing requirement for the Thames Gateway South Essex Strategic Housing Market area may be distributed such that Rochford District accommodates more or fewer than the Objectively Assessed Need identified in the SHMA – and this Environmental Capacity Study will be key evidence to inform such decision-making for emerging Local Plans.

Environmental Capacity and Ecosystem Services

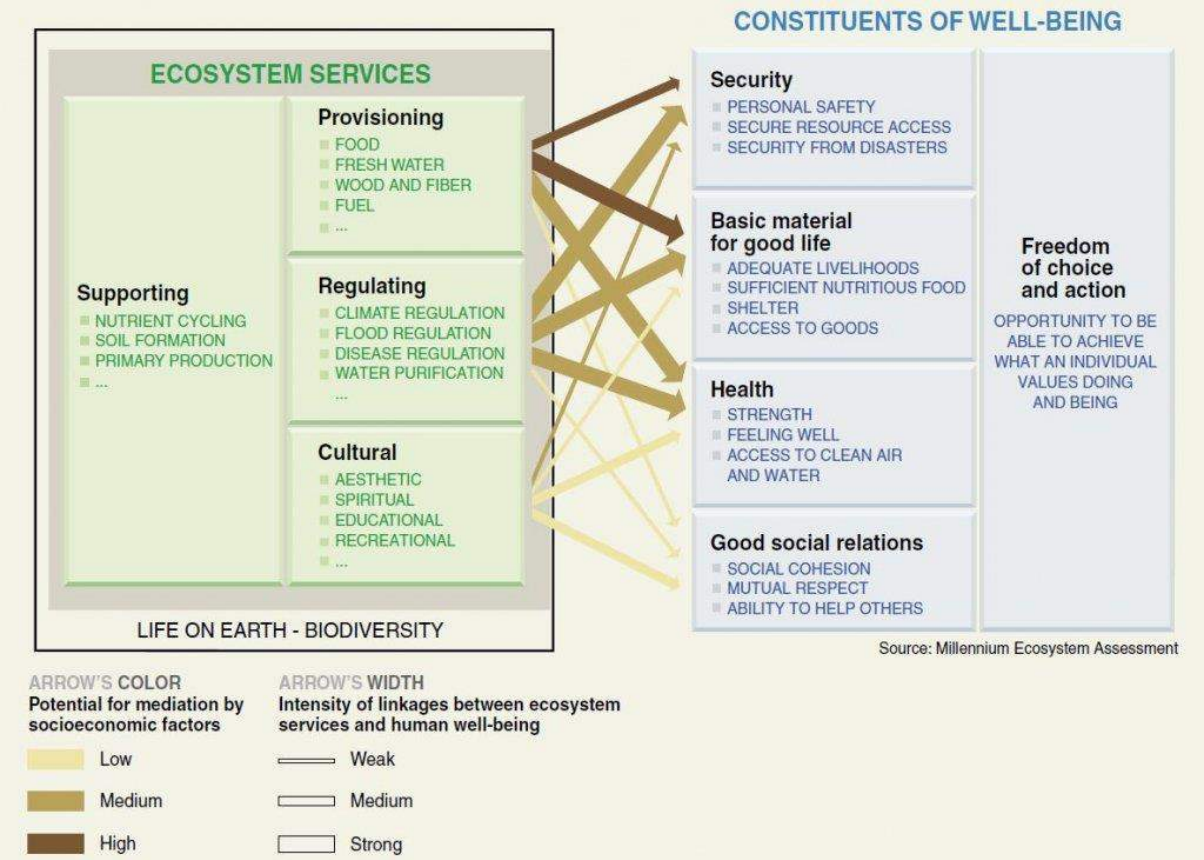
1.9 The concept of environmental capacity derives from definitions used in biological studies that refer to the carrying capacity of a species as the

[3] http://www.rochford.gov.uk/sites/rochford.gov.uk/files/documents/files/planning_all_allplan.pdf
[4] http://www.tgessex.co.uk/downloads/TGSESHMAReviewDec2013Final.pdf
[5] http://www.legislation.gov.uk/ukpga/2011/20/section/110/enacted

maximum population size of that species that can be sustained indefinitely within its environment. Populations vary according to a range of factors including habitat or living space, air, light, food and water, provided by the environment. Concern that humans were living beyond the environmental carrying capacity of the Earth prompted the UN Millennium Ecosystem Assessment[6] (MEA, 2005) that reported how natural resources were being degraded and lost at a global scale. The MEA demonstrated that human health and well-being depends upon the services provided by ecosystems and their components - water, soil, nutrients and organisms. The MEA recognised that people are integral parts of ecosystems and provided a classification of ecosystem services and a diagram to illustrate the dynamic interactions between ecosystems and human well-being as follows:

Supporting Services: necessary for the production of all other ecosystem services including soil formation, photosynthesis, nutrient and water cycling
Provisioning Services: products obtained from ecosystems such as food, water, fibre, timber, fuel, genetic resources and medicines
Regulating Services: affecting air quality and climate, floods and water quality, soils erosion, diseases and pollination
Cultural Services: benefits people obtain through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences

Diagram 1.1: Ecosystems Services and Human Well-Being[7]



[6] http://www.millenniumassessment.org/documents/document.356.aspx.pdf
[7] ibid

1.10 The UN MEA set out the scientific basis for development of policy to address the global degradation of ecosystems. The UK National Ecosystem Assessment[8] (NEA, 2011) defines Ecosystem Services as "*the benefits provided by ecosystems that contribute to making human life both possible and worth living*". The NEA provided a comprehensive account of how the UK's natural environment provides us with services that are critical to our wellbeing and economic prosperity. It also showed that natural assets are consistently undervalued in decision-making and that the services we get from nature are in decline.

1.11 The Ecosystem Approach is embedded now in policy for planning and management of the natural environment in England. This is underpinned by key principles as follows:

- Taking a more holistic approach to policy-making and delivery, with the focus on maintaining healthy ecosystems and ecosystem services
- Ensuring that the value of ecosystem services are fully reflected in decision-making
- Ensuring that environmental limits are respected in the context of sustainable development, taking into account ecosystem functioning
- Taking decisions at the appropriate spatial scale, while recognising the cumulative impacts of decision
- Promoting adaptive management of the natural environment to respond to changing pressures, including climate change
- Identifying and involving all relevant stakeholders in the decision and plan making process

1.12 Environmental capacity, thresholds and limits are closely linked with an ecosystem approach to policy and plan-making. Ecosystems and their services are affected by human actions – and human actions are affected by changes in ecosystems – in a dynamic interaction. Environmental capacity was defined for the marine environment by GESAMP (1986)[9] as "*a property of the environment and its ability to accommodate a particular activity or rate of an activity…without unacceptable impact*".

1.13 Sustainable development is predicated on society living within natural limits and the UK SD Strategy[10] (2005) defines environmental limits as "*the level at which the environment is unable to accommodate a particular activity or rate of activities without sustaining unacceptable or irreversible change*." An environmental threshold may be defined as the point at which the functioning of an environmental asset changes such that the services provided are insufficient or judged unacceptable.

1.14 Thresholds and limits may be informed by scientific understanding, such as the point at which a habitat cannot support a certain species or loss of a water

[8] http://uknea.unep-wcmc.org/EcosystemAssessmentConcepts/EcosystemServices/tabid/103/Default.aspx
[9] Environmental Protection) 1986. Environmental Capacity. An approach to marine pollution prevention. Rep.Stud.GESAMP. (30):49p.
[10] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69412/pb10589-securing-the-future-050307.pdf

resource is irreversible, but environmental capacity is often determined by political judgment and societal choices that decide what change is acceptable. Some factors can be directly measured, such as water flow and quality, whilst others are more subjective, such as landscape quality and aesthetic value.

Environmental Capacity and Spatial Planning

1.15 Some environmental limits are agreed through international and national quantitative targets or standards, for example, limiting carbon emissions to reduce climate change and limiting pollutants to air and water to protect human health. Some environmental limits are set out through national planning policy (NPPF) to guide development from flood risk and protect the most important (what society considers to be valuable) natural and historic assets. Such environmental limits restrict the potential areas of land available for additional housing development.

1.16 In assessing the capacity of the environment to accommodate change arising from additional development, it is important to consider the cumulative effects of different activities on the ecosystems and their services. Whilst initially each environmental topic is investigated according to its own characteristics and standards/targets, interactions between topics must also be considered. Housing proposals may not exceed any individual definable environmental limit, but may affect a range of environmental factors that together exceed the acceptable capacity of that location to accommodate such development without irreversible loss or damage.

1.17 It is possible to avoid, mitigate and/or compensate for potential effects of proposed development and thus increase the environmental capacity of an area. For example, water efficient appliances and sustainable drainage systems can allow for more development to be delivered without unacceptable abstraction of water or flooding risk. The restoration and creation of habitats to strengthen green infrastructure can help to compensate for those lost to development. Screening, choice of materials and careful design of buildings can help make new developments more acceptable to local people.

Aims and Objectives

1.18 The overall aim of the study is to consider the capacity of the environment to accommodate housing development additional to that already set out in the adopted Core Strategy. The Objectives of the study are as follows:

- Identify the ecosystem services provided by the environment, including how they interact, and their importance for the District and wider adjacent areas
- Provide an overview of the current environment, including existing and potential future trends
- Set out the potential effects of development on the environment as well as current mitigation measures

- Carry out an assessment to determine the sensitivity of the environment to change, trying to identify thresholds and tipping points[11] beyond which adverse effects may occur
- Determine the level of growth that could be accommodated before tipping points are reached
- Identify further mitigation measures to reduce the likelihood of tipping points being reached
- If possible, identify broad areas in the District that have the least sensitivity and therefore greatest capacity to accommodate development

Structure of this Report

1.19 Following this introduction, Section 2 sets out the methods including scope and approach for this study. Sections 3-7 sets out the findings of the study by key themes – Air & Climate; Land, Soils & Minerals; Water; Biodiversity; and People, including Landscape, Recreation & Amenity, Heritage & the Historic Environment. Section 8 is a synthesis of the findings including interactions and interdependencies between themes with recommendations and suggestions for any further studies that might be required to address any uncertainties or gaps found during the study. The findings of each theme should be considered in conjunction with each other – and as integrated into the final Synthesis section.

[11] "the moment when an idea, trend or social behaviour crosses a threshold, tips and spreads like wildfire" Gladwell (2000) http://gladwell.com/the-tipping-point/

2.0 APPROACH & METHODS

Approach

2.1 Ecosystems are often defined in terms of their dominant vegetation or environmental features, for example, an oak forest, a mountain or a lake. However, as the UKNEA explains, the main identifying feature of an ecosystem is its properties as a system. "*In reality, the concept of an ecosystem is a human construct to describe the natural world and we define ecosystems according to the scale of our interests and decision-making powers*"[12].

2.2 Ecosystems can be defined as areas that share similar features and characteristics such as geophysical conditions, vegetative cover, species composition, resource management, and use by humans. Thus, the UKNEA advises a pragmatic approach for analysis and assessment purposes to identify ecosystems and their boundaries according to the questions that are being asked. This study seeks to identify the capacity of the environment to accommodate additional housing development for the Rochford District area together with consideration of neighbouring areas. This defined the scope of the approach and methods by considering the changes that would occur to ecosystems and their services with consequences for human well-being and natural resources management.

2.3 Five key environmental themes were identified as follows:

- **Air & Climate:** air quality and climate change
- **Land, Soils & Minerals**: greenfield and agricultural land quality, soil character, brownfield and contaminated land; minerals
- **Water**: water quality, resources and flood risk - freshwater and marine
- **Biodiversity:** habitats, species – terrestrial and marine
- **People Health & Well-Being**: (landscape & visual amenity, recreation & amenity, cultural heritage & the historic environment

2.4 Each theme and its component topics was investigated individually to identify environmental constraints, issues and capacity (where possible) relative to a spatial area. Interactions between topics were identified together with the potential for any significant cumulative effects. These emerging findings were debated in a roundtable discussion with RDC planning Officers to provide clarification and locally specific information through professional judgment. This informed the next stage of integrating the

[12] http://uknea.unep-wcmc.org/EcosystemAssessmentConcepts/tabid/98/Default.aspx

potential capacities of environmental topics. Interactions and cumulative environmental effects were considered, together with the possibilities for mitigating adverse effects. Emerging findings were then presented to a workshop with key stakeholders from RDC, neighbouring LPAs, and the environmental regulators. This included sub-areas identified as providing certain ecosystem services and environmental capacity characteristics. The outcomes from this debate informed the development of suggestions to inform decision-making with regard to accommodating additional housing.

2.5 There is uncertainty about the functioning of ecosystems and the ways that ecosystems change such that a precautionary approach was taken - in accordance with UK Government principles.

Information

2.6 This study was desk based, using existing qualitative and quantitative sources of information held by Rochford Council, Defra MAGIC map[13], Environment Agency, English Heritage, Natural England, and other organisations including the Thames Gateway Local Nature Partnership. Where possible, information was graphically recorded and presented in Appendix IV of this report as Figures 1-10.

Methods

2.7 Each of the environmental themes and its component topics was generally investigated as follows:

- **Introduction:** setting out the ecosystem services provided
- **Policy Context**: summarising international, national and local policy that provides protection to environmental factors, constraint to development, mitigates adverse effects, and guides location and design of acceptable development
- **Current & Predicted Condition**: setting out the characteristics and condition of the environmental theme, including trends and any indication of how the condition is likely to change
- **Key Issues**: summarising the key issues identified from the baseline information
- **Effects of Development**: summarising the type of effects and impacts from housing development on the environmental topics
- **Sensitivity, Significance & Capacity**: consideration of the sensitivity of the topic to effects from housing, likely impacts and significance, potential for mitigating adverse effects, and an evaluation of capacity - including spatially if possible

2.8 The capacity of certain environmental topics is determined by specific policy, legislation, guidance, and standards/targets, for example, flood risk, water supply and wastewater treatment works. Licensing and permitting for abstractions from and discharges to air, land and water are based on scientific quantitative analysis to control the quality of these environmental

[13] http://magic.defra.gov.uk/MagicMap.aspx

factors. The capacity of other environmental factors, such as landscape and visual amenity, are subjective and assessments are based on qualitative analysis.

2.9 The capacity of the environment to accommodate change from proposed development needs to consider the sensitivity of the receiving environment (including people and communities) to the likely impacts arising from proposed development. Sensitivity to change varies with the characteristics and condition of each environmental topic. These are considered within relevant environmental boundaries that reflect the likely zones of influence for each environmental topic.

2.10 The sensitivity of a defined environmental area is derived from combining judgments on the susceptibility of the receiving environment to change, and the value attached to the receiving environment. Susceptibility considers: the nature and use of existing assets/systems/features, stability, robustness and fragility of the receiving environment, the condition of the receiving environment, and patterns of change. Susceptibility may be described using categories of significance - high, medium or low - as set out in the following table:

Table 2.1: Susceptibility of the Receiving Environment to Change – Categories of Significance

Susceptibility Significance	Definition
High	A receiving environment where the majority of resources/assets/attributes are unlikely to withstand change without causing a change to overall quality/quantity/character to the extent that it will be difficult or impossible to recover/restore. The sensitivity of environmental receptors is also likely to be high.
Medium	A receiving environment with a combination of resources/assets/attributes that is capable of absorbing some degree of change without affecting overall quality/quantity/character. It is less likely that there are large numbers of sensitive environmental receptors.
Low	A receiving environment where the majority of resources/assets/attributes are robust and/or tolerant of change to the extent that change or development will have little or no effect on overall quality/quantity/character. It is likely to be easily restored and the sensitivity of environmental receptors is likely to be low.

2.11 Value considers: the quality/quantity/use of the receiving environment/community, rarity and representativeness, conservation interests, cultural values and recreational values. Value may also be described according to categories of significance - high, medium and low – as set out in the following table and based on the approach taken for landscape and visual amenity assessments.

Table 2.2: Value of the Receiving Environment - Categories of Significance

Value Significance	Definition
High	Areas that have a very strong positive character with widely valued and consistent distinctive features that give the receiving environment unity, richness and harmony. There may be national or regional landscape, biodiversity, water, heritage and conservation designation areas.
Medium	Areas that exhibit a positive character but which may have evidence of ongoing evolution, alteration, degradation or erosion of features resulting in a less distinctive character. There may be areas of District or local significance for landscape, nature, recreation, water or conservation values.
Low	Areas that are generally more negative in character, degraded and in poor condition. No distinctive positive characteristics and with little or no structure. Scope for positive enhancement.

2.12 Judgments of the relationship between susceptibility and value are combined to determine sensitivity – and again, categories of significance can be determined as high, medium or low, for example, as for landscape and visual amenity in the table following:

Table 2.3: Landscape & Visual Amenity Sensitivity – Categories of Significance

Sensitivity Significance	Definition
High	A landscape highly sensitive to change, by virtue of inherent physical form, aesthetic and perceptual qualities that form its character. The receiving environment may be highly susceptible to change and considered to be of high value.
Medium	A landscape where change may be accommodated to some degree without affecting overall character, by virtue of its inherent physical form, elements, aesthetic and perceptual or recreational qualities. The receiving environment may display some characteristics that are considered to be of high susceptibility and / or value, although not exclusively so.
Low	A landscape where change may be readily accommodated, by virtue of its inherent physical form and elements, aesthetic and perceptual qualities that form its character. The receiving environment may be of low susceptibility to change and of low value. Scope for positive enhancement.

2.13 The sensitivity of receiving environments does not necessarily correlate with distance from the source of the development change. For example, the

settings of cultural heritage assets are important and impacts can be very site specific; flow/quantity changes and pollution of water can impact many kilometres away from the source – depending upon the availability and transport by pathways through aquifers and rivers.

2.14 Effects and impacts are terms often used interchangeably in environmental assessment processes. For example, Environmental Impact Assessment (EIA) of development projects considers that effects may or may not lead to impacts whilst Habitats Regulations Assessment (HRA) of plans and projects considers that impacts may or may not lead to effects. Regardless of this confusion of terminology, this Environmental Capacity Study is a strategic study and considers the likely effects on environmental factors from additional housing development.

2.15 Sensitivity is considered alongside the likely effects of housing development to give an overall indication of the capacity to accommodate change and again, categories of significance can be determined as high, medium or low, for example, as for landscape and visual amenity in the table following:

Table 2.4: Landscape & Visual Amenity Capacity – Categories of Significance

Capacity Significance	Definition
High	Strong ability to accommodate and absorb significant housing growth, without affecting the receiving environment qualities or overall character, or areas of national, regional or local significance. Scope for positive enhancement of the receiving environment.
Medium	An ability to accommodate and absorb a small amount of housing growth without affecting the receiving environment qualities, overall character or areas of national or regional significance.
Low	Severely limited to no capacity to accommodate housing growth without affecting the receiving environment qualities, overall character or areas of national or regional significance.

2.17 Generally, a similar approach as illustrated above with particular reference to assessment for landscape capacity was followed for each environmental topic. It is important that the findings for each environmental theme and its component topics are considered in conjunction with each other and as reported within the final Synthesis section.

2.18 Cumulative effects arise where several developments each have insignificant effects but together have a significant effect; or where several individual effects of a plan (or plans) have a combined effect. Synergistic effects interact to produce a total effect greater than the sum of the individual effects. Secondary effects are not a direct result of a plan but occur away from the original effect or as a result of a complex pathway. Consideration of cumulative effects is a mandatory requirement in Sustainability Appraisal

(SA)/Strategic Environmental Assessment (SEA) of local plans in England, and for in-combination effects in Habitats Regulations Assessment (HRA).

2.19 Cumulative and synergistic effects are often characterised by small changes that may not be noticed until a tipping point is reached, for example, loss or fragmentation of a wildlife habitat with limited effects on particular species until the area goes over that tipping point, or capacity, to be able to support the species at all. Whilst thresholds can be a useful way of identifying the capacity of habitats, resources or human communities to accommodate proposed development, it is often professional judgment that is needed to estimate a potential tipping point.

2.20 Such cumulative effects are also often associated with indirect and inter-related effects, for example, the health benefits to people of being able to access open space - and that area providing a wildlife resource. For HRA, in-combination effects are also focused on receptors – European sites with their conservation objectives and consideration of predicted effects, for example, on water levels and quality, air quality, habitat loss, fragmentation and disturbance. Recreational and amenity use is a key factor here.

2.21 Interactions, Cumulative Effects and Synthesis: professional judgment was used to help determine the interactions, cumulative effects and potential implications for decision-making. Two interactive sessions were held during November 2014 with professionals and various experts on environmental topics - a roundtable discussion with Council Officers as well as a workshop forum with key stakeholders including the environmental regulators (although no representatives could attend) and neighbouring Local Planning Authorities (LPAs).

Consultation

2.22 The emerging findings of the Environmental Capacity study were discussed by the key stakeholders. Generally, there was agreement with summary findings; some further detailed information was provided for the Environmental Capacity themes. The stakeholders advised that they would like RDC to establish what additional housing can be delivered and where - with a map showing areas to avoid and potential areas for development. RDC explained that the Environmental Capacity study is a separate piece of evidence to the results of objectively assessed housing need, but together these will inform an appropriate housing figure for the Rochford Council area. Attendees and the summary notes from the key stakeholder workshop are provided in Appendix II.

2.23 The Environmental Capacity Study was updated to take account of the outcomes of the workshop with key stakeholders in November 2014. It was then sent to key stakeholders for further review and comment from 17 June to 01 July 2015. The responses received and how they have been taken into account are presented in Appendix III of this Report. The Environmental Capacity Study was also made available to Rochford District Council Members for review and comment until the end of September 2015; however, no responses were received.

3.0 AIR (QUALITY & CLIMATE CHANGE)

Introduction

3.1 Air is an abundant resource that is intrinsically linked to ecosystem services and human health. Air contributes to the environment in a number of ways, including through oxygen provision to most living beings and the pollination of plants and trees. Poor air quality has direct adverse effects on human health and well-being. Poor air quality can have effects for other ecosystem services, for example, polluted air traps more heat thus raising the temperature of urban areas which can then affect water and biodiversity, although this is more associated with cities and dense urban areas such as London. Air quality is affected by human activities, in particular by polluting transport modes such as cars, and by emissions of carbon (particularly through energy use) that contribute to climate change. The effects of emissions on flood risk are considered later in section 5 on the water environment. The range of ecosystem services that are provided by air is summarised in the following table:

Table 3.1: Ecosystem Services Provided by Air

Provisioning Services *The products obtained from ecosystems.*	**Regulating Services** *The benefits obtained from the regulation of ecosystem processes.*	**Cultural services*** *The non-material benefits people obtain from ecosystems.*
	▪ Air quality regulation ▪ Human Health and well-being ▪ Health* of flora and fauna ▪ Climate regulation≠ ▪ Pollination	▪ Health of flora and fauna
Supporting Services *Ecosystem services that are necessary for the production of all other ecosystem services.*		
▪ Atmospheric oxygen		
*** These regulating and cultural services provided by air are addressed later within the EC theme Biodiversity (section 6)** **≠ Carbon emissions and climate change affecting flood risk are addressed later in the EC theme Water (section 5)**		

Policy Context

3.2 The NPPF (paragraph 124) requires that planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas (AQMAs) and the cumulative impacts on air quality from individual sites

in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan. Paragraph 109 requires preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

3.3 One of the objectives of the Rochford Core Strategy is to improve air quality and Policy ENV5 restricts residential development in AQMAs to reduce public exposure to poor air quality. It also seeks to reduce the impact of poor air quality in areas where public health and quality of life is threatened. Policy T3 promotes public transport, Policy T5 encourages implementation of Travel Plans and Policy T6 promotes cycling and walking. Renewable and low carbon development is promoted though Policies ENV7 and 8. Policy ENV9 requires Code[14] for Sustainable Homes Level 4 from 2013 and the zero carbon target (Level 6) from 2016.

Current Situation

3.4 Air quality objectives for seven pollutants are set out in the AQ (England) Regulations (2000, as amended 2002). As with most other neighbouring Districts, the main source of local air pollution is from motor vehicles emitting nitrogen oxides, carbon monoxide and dioxide, and fine particulate matter. Problems arise particularly where traffic is slow moving such as through older, narrow streets and/or near town centres. The pollutants of most concern with regard to human health are nitrogen dioxide and fine particulates.

3.5 Automatic AQ monitoring sites have been located in Rayleigh High Street (for nitrogen dioxide) and at the Rawreth Industrial Site in Rayleigh (for particulate matter) with data recorded through the Essex AQ Forum[15]. RDC declared an AQMA for particulate matter at the Rawreth Industrial Estate in June 2010 but this was subsequently revoked in March 2013 following measured improvements during 2011-12.

3.6 A common cause of poor air quality is congestion and heavy road usage by polluting vehicles. Within Rochford District, the areas that experience the most congestion include:

- Within the existing settlements
- Along the A130 corridor (running north-south to the west of the District)
- Along the A127 corridor (running east-west to the south of the District), including significant capacity constraints for areas along the border of Rochford and Southend-on-Sea to the east

3.7 Levels of nitrogen dioxide arising from vehicle emissions are monitored continuously for 6 months every year in Rayleigh High Street; intermittent measurements of nitrogen dioxide using diffusion tubes are made at 8

[14] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/5976/code_for_sustainable_homes_techguide.pdf
[15] http://www.essexair.org.uk/AQInEssex/LA/Rochford.aspx

locations in the towns of Rochford and Rayleigh. Concern[16] about levels of nitrogen dioxide in Rayleigh town centre has prompted the Council to declare an AQMA for Rayleigh and a public consultation on the extent of the AQMA was undertaken 20 October- 14 November 2014. The AQMA for Rayleigh High Street was declared on 30 January 2015[17]. The Council will adopt an Air Quality Action Plan (AQAP) to improve air quality and address this local pollution issue.

3.8 Much of the transport infrastructure can be found in the western half of the District, and this is likely to be the area that experiences the most polluting emissions. Only one AQMA is listed by one of the five neighbouring LPAs according to the Essex AQ Forum. However, four out of five of these councils do report that the main sources of air pollution in their areas are from road traffic emissions (see Figure 01 for main transport routes).

3.9 For Southend-on-Sea BC, this is from the A13, A127 and A1159. The A13 is to the south of the Borough and the A1159 is a continuation link from the A127 running east-west into Southend-on-Sea and linking into London Southend Airport situated in Rochford District and adjacent to the boundary of Southend-on-Sea Borough. The A127 to the west forms the south-west boundary between these two LPAs.

3.10 Castle Point Borough located to the south-west of Rochford District lists road traffic emissions from the A13, A127 and A130 as the main source of air pollution. Chelmsford City Council to the north-west of Rochford District has declared one AQMA in the city and lists road traffic emissions as the main source of air pollution, particularly the A12, A414, A138 and B1016 that are not close to the Rochford boundary. Maldon District to the north of Rochford District reports that is does not have any areas of concern with regard to air quality and transport related emissions.

3.11 Southend-on-Sea, Castle Point, Basildon and Chelmsford Councils also advise that other pollution sources, including commercial, industrial and domestic sources, contribute to background pollution concentrations. Castle Point Borough indicates that the power stations along the Thames Estuary and the oil refinery at Thurrock are potential transboundary pollution sources.

Key Issues Arising from Baseline Information

- AQMA to be declared in Rayleigh town centre with nitrogen dioxide exceeding environmental quality limits
- Poorer AQ likely to the west and south-west of the District and associated with road traffic emissions and the key transport corridors of the A130 and A127, including routes into Southend-on-Sea and to the London Southend Airport

[16] http://www.rochford.gov.uk/sites/rochford.gov.uk/files/environ_airqualityprogress2014.pdf
[17] http://www.rochford.gov.uk/sites/rochford.gov.uk/files/environ_airqualityorder.pdf

Effects of Development

3.12 Housing and associated infrastructure development has the potential to generate environmental impacts that can (depending on their nature, magnitude, location and duration) have effects on air quality. This is primarily associated with pollution (nitrogen dioxide and fine particulates) from increases in road traffic and as summarised in the following table:

Table 3.2: Impact Types and Potential Effects on Air

Impact Types	Effects on Air
▪ Dust and air pollution during construction ▪ Air pollution through increased road traffic ▪ Increased carbon emissions	Increased pressures on existing AQMAs and identified congested transport routes with air quality degradation – and subsequent adverse effects on human health and well-being Contribution to climate change

Sensitivity, Significance and Capacity

3.13 Generally, the quality of air in the sub-regional area is good compared with the densely urban area of nearby London where each borough has declared AQMAs. Rayleigh in Rochford District, as well as Chelmsford in Chelmsford Borough, have AQMAs associated with congestion and emissions from road traffic. However, the AQMA in Rayleigh was only declared in January 2015 indicating that the situation has been deteriorating, although that at Rawreth Industrial Estate was revoked in 2013. Monitoring AQ will be a requirement for new development within the London Southend Airport Joint Area Action Plan area extension.

3.14 It had been considered by Defra that tighter emissions control and newer vehicles would mitigate for increased numbers of vehicles so that overall ambient air quality would continue improving in the UK in the longer term. However, the analysis of trends monitoring indicates that there is now a gap between current projected vehicle emission reductions and projections on the annual rate of improvements in ambient air quality. This has resulted in revised guidance (Advice Note 170/12)[18] by the Highways Agency (HA) in respect of environmental impact assessment for proposed road schemes. Although a linear relationship is assumed up to 2030, the HA advise that a precautionary approach should be taken for predicted impacts between 2017 and 2030.

[18] http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian170.pdf

3.15 Much of the inter-urban network in the sub-region is acknowledged by the Essex Transport Plan[19] as being at or near capacity in the peak periods with particular problems for the A127 and the A13 providing important links between the Thames Gateway centres and London. Congestion problems in Rochford and Rayleigh are also recorded with their subsequent effects on reducing air quality. The indications are that the roads to the west, south-west and south of the Rochford District are near capacity and that a precautionary approach should be taken to consideration of additional housing development with associated increase in road vehicles and any further reduction in air quality.

3.16 The key stakeholders agreed that overall the A130 is not a particular issue with the exception of the Fairglen Interchange [A127 with the A1245 (previously A130)] between Rayleigh and Basildon. This is considered to be one of the busiest junctions in Essex allegedly used by 70,000 drivers a day. It was noted that although medium term improvements are in place, longer term solutions are required. Essex County Council and Southend Council submitted a bid (April 2014) into the South East Local Enterprise Partnership (SELEP) that included some improvement to the Fairglen Interchange through provision of a new slip road that is intended to reduce congestion.

3.17 Areas of poorer air quality are associated with traffic congestion and use of motor vehicles. The emissions from associated increased vehicle use will not have any significant effects on flood risk (and see later section 5 Water). Mitigation for additional vehicle use arising from new housing development is available as follows:

- Highway improvements, particularly to reduce congestion
- Provision of better and more efficient public transport
- Improve walking and cycling routes
- Improve rail lines and train services

3.18 Additional housing would be associated with increased energy requirements that could contribute to the carbon loading into the atmosphere and climate change. However, the additional loading is considered to be insignificant compared to the overall housing development proposed for Rochford District and the sub-regional area. Also, such additional effects will be mitigated through design requirements for housing to optimise energy efficiencies with the use of renewable or low carbon energy sources as Government policy[20] directs building for domestic developments to be carbon-neutral by 2016 and for non-domestic development by 2019. Thus there will be no carbon emissions arising from energy use for additional new housing development as building meets with the carbon neutrality targets by 2016.

[19] http://www.essex.gov.uk/Environment%20Planning/Planning/Transport-planning/Documents/Essex_Transport_Strategy.pdf

[20] Carbon Plan (DECC, 2010) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47621/1358-the-carbon-plan.pdf

Table 3.3: Air Capacity (See Figure 01)		
Summary: Poorer air quality (including designated AQMAs in Rayleigh and Chelmsford) and carbon emissions are associated with road traffic and congestion. Roads to the west, south-west and south of the Rochford District are near capacity.		
Sensitivity: High	**Likely Impacts & Significance**	**Capacity: Low**
Roads and traffic in the district and sub-region are already at or near capacity.	Additional housing likely to be associated with increased vehicle use. Carbon emissions from new housing and implications for climate change will be insignificant as Government policy directs building to zero-carbon by 2016.	Development is likely to result in increased vehicle use but this could be mitigated through highway improvements and provision of improved sustainable transport networks.

4.0 LAND, SOILS & MINERALS

Introduction

4.1 Soils together with the character, form and use of the land are one of the key elements underpinning ecosystem services. Soils are intrinsically linked to all the other themes and provide resources for biodiversity, water and people. Soils and geology are the foundations that shape our environment, determining how the land is used with associated development, where and how people live, work and move, and what kind of natural habitats flourish.

4.2 Land is often the key determinant in the type of environment it provides, for example, fertile soils creating conditions for certain plant and food growth, or waterlogged peatland with anaerobic conditions suited to bogs and moss growth, or provision of minerals resources such as sand and gravel. Understanding the underlying geology often gives insight into the environments as they exist today, and how they are likely to progress. The range of ecosystem services that are provided by land and soils are summarised in the following table:

Table 4.1: Ecosystem Services Provided by Land, Soils & Minerals

Provisioning Services *The products obtained from ecosystem.*	**Regulating Services** *The benefits obtained from the regulation of ecosystem processes*	**Cultural services*** *The non-material benefits people obtain from ecosystems*
▪ Food e.g. crops, fruit, fodder for animals ▪ Mineral deposits / raw materials ▪ Fibre and fuel e.g. timber, coal ▪ Biochemicals for natural medicines and pharmaceuticals ▪ Genetic resources	▪ Climate regulation (avoidance of climate stress, temperature regulation) ▪ Water regulation ▪ Carbon sequestration ▪ Waste decomposition ▪ Water purification ▪ Natural drainage	▪ Aesthetic values ▪ Recreation & Tourism ▪ Social values ▪ Spiritual or Religious values ▪ Inspiration (e.g. for art, folklore, architecture) ▪ Cultural Heritage values ▪ Health & well-being ▪ Science and education
Supporting Services *Ecosystem services that are necessary for the production of all other ecosystem services*		
▪ Weathering (soil formation) ▪ Provision of habitats ▪ Nutrient cycle (movement & exchange of organic and inorganic matter) ▪ Primary production ▪ Water cycle (continuous movement of water on, above & below earth)		
*** These cultural services provided by land are addressed later within the EC theme People in section 6; water regulation, purification, recycling and drainage provided by soils/geology are addressed later within the EC theme Water in section 5**		

Policy Context

4.3 The NPPF requires that LPAs should encourage the effective use of land by re-using land that has been previously developed (brownfield), provided that it is not of high environmental value (paragraph 111). LPAs are required to take into account the economic and other benefits of the best and most versatile agricultural land. Where significant development of agricultural land is demonstrated to be necessary, LPAs should seek to use areas of poorer quality land in preference to that of a higher quality (paragraph 112). The long term potential of the best and most versatile agricultural land should be safeguarded, together with conserving soil resources (paragraph 143). The NPPF defines the best and most versatile agricultural land as land in grades 1, 2 and 3a of the Agricultural Land Classification (ALC). Paragraph 109 requires preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil or land instability. Section 13 (paragraphs 142-149) is concerned with facilitating the sustainable use of minerals.

4.4 The purpose of the Rochford Core Strategy, Site Allocations Plan and the four Area Action Plans is to guide the sustainable development of the land in the Rochford District area. Policy H1 on the efficient use of land for housing takes into account (*inter alia*) the agricultural value of land. Whilst the District is predominantly Green Belt, only 3% of its VAT registered businesses are agricultural – less than the regional and national averages[21]. Management of waste is guided by the Essex & Southend Waste Local Plan (adopted, 2001); the Replacement Waste Local Plan is currently being prepared and will address waste planning until 2032 including allocations for sites. The Essex Minerals Local Plan was adopted in July 2014. Core Strategy Policy ENV11 guides remediation and development on contaminated land.

Current Situation

4.5 The topography of the Rochford District area and adjacent areas is shown on Figure 02. The District is situated within a peninsula between the River Crouch to the north and the River Thames to the south, and is bounded to the east by the North Sea. The District is predominantly rural. The coastal area to the east is largely undeveloped, relatively inaccessible and characterised by marsh and sandy flatlands that are important for ecological value, together with Foulness Island owned by the Ministry of Defence and with restricted access. The River Roach and its tributaries drain towards the north-east and into the River Crouch, dominating the flat wetlands of the eastern third of the District by the sea. The River Crouch provides marine boundaries with the neighbouring LPAs of Maldon and Chelmsford to the north.

4.6 The land gently slopes up to some 10-20 m above sea level in the middle section of the District and around to the north-east. An area of slightly higher ground to some 50-70m above sea level is found in the centre of the western part of the District in the Upper Roach Valley and extending southwards into the Castle Point Borough area. Historically, settlements were founded on the

[21] http://fs-drupal-rochford.s3.amazonaws.com/pdf/planningpolicy_cs_adoptedstrategy.pdf

higher ground and this can be seen now with the locations of Rayleigh and Hockley, and Rochford town.

4.7 Thus the use of the land and development of settlements has progressed in the western part of the District with the urban areas on the higher land and in these areas that are more accessible with supporting road and rail routes (as shown on Figure 01). The adopted Rochford Core Strategy and the four AAPs guide most new development to be integrated with the existing three towns and around the airport.

4.8 Rochford District does contain large areas of the best and most versatile agricultural land (Figure 04). The higher quality Grade 1 and 2 agricultural land can be found in the central area of the District, as well as on Foulness Island. The majority of the remaining land around the urban areas is Grade 3, although it is unknown whether this is Subgrade 3a or 3b. The District comprises predominantly agricultural land, which is in contrast to much of the built-up urban environment to the south in the neighbouring Council areas of Southend-on-Sea and Castle Point.

4.9 The soils in the District[22] include:

- Loamy and Clayey soils of coastal flats with naturally high groundwater (predominantly in the east of the District, but also in the north surrounding the River Crouch)
- Freely draining acid loamy soils over rock (predominantly in the south and central area of the District)
- Fen peat soils (predominantly in the central area of the District just north of the River Roach)
- Slightly acid loamy and clayey soils with impeded drainage (predominantly in the central area of the District)
- Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (predominantly in the west of the District, and stretching east across the north of the District)

The nature and quality of these soils have contributed to the agricultural success of Essex, although problems can arise in winter when the coastal marsh soils are wet.

4.10 Thus, the geology of Essex provides a variety of mineral deposits, including sand and gravel, silica sand, chalk, brick clay, and brickearth[23]. The largest extractions within Essex are of aggregates (sand and gravel), and all extractions are worked at surface level; there are no underground mines in Rochford or Essex County. Essex County Council is responsible for minerals planning, and adopts a minerals supply approach that prioritises reducing

[22] DEFRA Magic Map [online] http://www.magic.gov.uk/
[23] Essex County Council (2014) Essex Minerals Local Plan – Adopted [online] http://www.essex.gov.uk/Environment%20Planning/Planning/Minerals-Waste-Planning-Team/Planning-Policy/minerals-development-document/Documents/Essex%20Minerals%20Plan%20-%20Adopted%20July%202014%20v2.pdf [accessed November 2014]

demand and recycling over new extraction, conserving resources wherever possible. Policy S8 seeks to safeguard mineral resources and reserves.

4.11 Rochford District contains most of the brickearth deposits but these are not currently being extracted. Sand and gravel in Rochford District is the least workable in the county. One Strategic Aggregate Recycling Site is located in the Rochford area at Purdeys Industrial Estate and one coated stone plant at Suttons Wharf; these are the two sites safeguarded in the Minerals Plan. There are no hard rock deposits in the County and as such, this material is imported. Mineral deposits, including the two safeguarded sites, are shown on Figure 03.

4.12 Much of the land is low lying, with the only areas of high ground located in the south west of the District. A subsoil layer of impermeable London Clay covers the underlying chalk strata, therefore making local water resources very limited (and see later section 5 Water).

4.13 Land may be contaminated as a result of industrial working and could cause risk of harm to human health, ecosystems, property or controlled waters. The Council produced a Contaminated Land Strategy (2003)[24] that sets out how potential contaminated land in the district will be identified and investigated. No contaminated land has been currently identified by Rochford District Council.

4.14 Land may be used for disposal and decomposition of wastes, although policy directs an approach for recycling and reuse. There are a number of permitted landfill sites in the area: The Essex and Southend Waste Local Plan (adopted 2001) lists one permitted landfill site that can take non-inert waste in the Rochford area at Barling. Any future landfill sites will be restricted by tighter locational constraints. There is also a tree/green composting specialist facility in Great Wakering with issues regarding bio-aerosols; and with a 250m consultation requirement from the Environment Agency. Sewage Treatment Works operated by Anglian Water Services Ltd are listed within Rochford at Havengore, Rayleigh East and West, and Rochford (see section 5 Water).

Key Issues Arising from Baseline Information

- Mostly low lying land with marsh and sandy flatlands to the east
- Loamy and Clayey soils
- Good quality (Grade 1-3) agricultural land through most of the District with high quality (Grade 1-2) in the central area
- Large areas of safeguarded mineral (brickearth) deposits in the central area (although currently not worked)
- No known contaminated sites
- Some permitted landfill sites in the area; any future landfill sites will be restricted by tighter locational constraints
- Development needs to 2025 focused within and around the three towns and the airport

[24] Rochford District Council (2003) Contaminated Land Strategy [online] http://www.rochford.gov.uk/sites/rochford.gov.uk/files/plans_and_strategies_contaminated_land_0.pdf [accessed November 2014]

- Areas to the south characterised by significant urban development of Southend-on-Sea and Castle Point; to the north mostly rural area of Maldon

Effects of Development

4.15 Housing and the associated infrastructure development has the potential to generate a range of environmental impacts which can (depending on their nature, magnitude, location and duration) have effects on land, soils and the associated land use including use of minerals resources. A summary of the types of impacts and effects that could arise as a result of development is provided in the following table.

Table 4.2: Impact Types and Potential Effects on Land and Soils

Impact Types	Effects on Land
▪ Direct land take	Loss of land/soil resource used for agriculture Loss of minerals
▪ Land use change	Loss of land/soil resource used for agriculture Potential loss of habitat or habitat disturbance, possible introduction of alien species, and potential loss of recreation, amenity use and value**
▪ Impermeable surfaces	Exacerbating existing natural drainage problems and increasing flood risk* Development could also help to address an existing drainage problem
▪ Contamination ▪ Remediation	Degrading the soil quality with potential effects on water quality, and health of humans, flora and fauna, and ecosystem services Development can also help to remediate contaminated land
▪ Increased waste generation	Increased demand for landfill with associated transport and contamination effects
* effects on drainage and flood risk are addressed in section 5 Water ** effects on biodiversity are addressed in section 6 and on their recreational and amenity use in section 7 People	

Sensitivity, Significance and Capacity

4.16 The potential for contamination of soils and the land through additional housing is very low and will be protected by pollution control policy and legislation; this is considered to be negligible. Increased waste generated by the potential additional housing is likely to be insignificant especially in the longer term as sustainable wastes management and planning are more strongly implemented. Therefore, the likely significant effects that would

influence the capacity of land and soils to accommodate more housing are associated with the loss or change of use of the land – with limited possibilities for any mitigation.

4.17 The land and soils of the Rochford District area may be categorised into three land use areas reflecting their characteristics, uses and relative values: East, Central and West (see Figure 04 Soils). The degree of sensitivity across the District, significance of effects, and capacity for change is explored in the tables below:

Table 4.3a: Land Area East (See Figure 04)		
Summary: Encompassing the islands east of the River Roach, including Wallasea Island and Potton Island. This area contains Grade 2 and Grade 3 agricultural land and is predominantly loamy and clayey soils of coastal flats with naturally high groundwater. There are no mineral deposits identified in the area. There is potential for land contamination in MOD sites and a historic landfill in the north of Wallasea Island.		
Sensitivity: Medium to High	**Likely Impacts & Significance**	**Capacity: Low**
This area contains some of the District's best and most versatile agricultural land (ALC 3 with some grade 2) currently used for grazing as compatible with the nearby important marine environment. Soils here support priority marine habitats and biodiversity that is internationally protected. It is considered to be **medium to high** susceptibility and **medium to high** value.	Loss of some of the best and most versatile agricultural land (ALC 2-3) and soils supporting strongly protected marine biodiversity would be significant. The land and soils in the area will be supporting birds for foraging and maybe roosting. Loss or disturbance would be unacceptable.	Development could result in the loss of some high quality agricultural land, and wetland soils that provide significant support for marine habitats and biodiversity that is internationally recognised.

Table 4.3b: Land Area Central (See Figure 04)		
Summary: Incorporating the land west of the River Roach, including Great Wakering and Paglesham, stretching east to include the urban areas of Rochford town and Hawkwell. This area contains Grades 1, 2 and 3 agricultural land and is a mixture of soil types. There is an abundance of mineral deposits (mostly brickearth) throughout this central area that is safeguarded but not worked currently.		
Sensitivity: Medium	**Likely Impacts & Significance**	**Capacity: Low - Medium**
The area contains mixed soil types supporting locally important biodiversity. This area contains the best and most versatile agricultural land (ALC 1-3) in the District, including ALC 1 in the south and ALC 2 in the middle part. The area contains most of the District's mineral deposits.	Development could hinder access to mineral deposits, although the extent of safeguarded areas and likely future use of the brickearth resources is unknown. Loss of ALC grade 1-2 would be significant, although the potential additional housing to deliver up to 2031	Development is likely to result in the loss of some of the best agricultural land in the District, and could hinder long-term access to mineral deposits in the area.

It is considered to be **medium** susceptibility and **medium** value.	(SHMA, December 2013) would not involve extensive landtake; additional studies may identify that some of the ALC 3 in the northern part is grade 3b and thus of less significance.	

Table 4.3c: Land Area West (See Figure 05)		
Summary: Covering the land in the west of the District including the settlements of Rayleigh and Hockley. This area is predominantly Grade 3 agricultural land and also includes three of the largest urban settlements in the District - Rayleigh and Hockley towns and Hullbridge to the north adjacent to Chelmsford District. The soil is predominantly slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils, and there are minor mineral deposits along the western District boundary.		
Sensitivity: Low	**Likely Impacts & Thresholds of Significance**	**Capacity: Medium**
The area is predominantly urban containing some of the largest settlements in the District and surrounded by agricultural land of ALC grade 3. The soils in this area are more permeable than in the other areas, making this area more likely to cope with changes in groundwater levels. It is considered to be **low** susceptibility and **medium** value.	Studies may identify that the agricultural land is partly ALC grade 3b that would be of less significance with regard to land take and loss. Significance depends on type of agriculture and its importance for food security and local economy.	Established urban area with only grade 3 ALC (compared to ALC 1-2 in the central area), the land is considered to be the most able to accommodate change and absorb housing growth.

5.0 WATER (RESOURCES, QUALITY & FLOOD RISK)

Introduction

5.1 Water is an essential element underpinning ecosystem services and is intrinsically linked to the other themes within this study. People are dependent on water resources for survival and their well-being; water is used for transport and enjoyed for recreation, amenity and cultural values. Water is essential for biodiversity. Land is shaped by the movement of water – rivers and by coastal erosion or accretion. Flow, quantity and quality of water is fundamentally inter-related. The marine environment, including estuarine areas, has distinctive characteristics and uses. Flood risk may arise from rivers (fluvial), high tides and storm surges.

5.2 A healthy aquatic ecosystem is composed of a community of animals and plants and its inter-related physical environment as follows:

- Morphology (shape and character of water bodies)
- Water quantity (volume and flow)
- Water quality (chemical and biological)
- Flora (bank-side and aquatic plants and micro-organisms)
- Fauna (aquatic animals (fish and zooplankton)

The range of ecosystems services provided by water are summarised in the following table:

Table 5.1: Ecosystem Services Provided by Water

Provisioning Services *The products obtained from ecosystems.*	**Regulating Services** *The benefits obtained from the regulation of ecosystem processes.*	**Cultural services*** *The non-material benefits people obtain from ecosystems.*
▪ Water supply to humans and biodiversity ▪ Energy e.g. hydro power	▪ Hydrologic Cycle (water movement & purification) ▪ Human Health and well-being ▪ Health of flora and fauna** ▪ Drainage and flood risk management; climate change regulation ▪ Eutrophication control ▪ Waste transport & treatment	▪ Human Health & well-being ▪ Aesthetic values ▪ Recreation & Tourism ▪ Spiritual or Religious values ▪ Inspiration (e.g. for art, folklore, architecture) ▪ Cultural Heritage ▪ Science and Education
Supporting Services *Ecosystem services that are necessary for the production of all other ecosystem services.*		
▪ Water cycle		

▪ Provision of habitats ▪ Nutrient cycle
*** These cultural services provided by water are addressed later within the EC theme People in section 7** **** Flora and fauna are covered within the EC theme on Biodiversity in section 6**

Policy Context

5.3 The NPPF (paragraph 94) requires local planning authorities to adopt proactive strategies to mitigate and adapt to climate change, taking full account of flood risk, coastal change, water supply and demand considerations. LPAs are further required to take account of the longer term and consider changes to biodiversity and landscape (paragraph 99). New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.

5.4 Paragraph 100 requires that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change.

5.5 Both new and existing development is prevented from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of water pollution by requirements in paragraph 109 of the NPPF.

5.6 The Rochford District adopted Core Strategy includes policies to protect water quality, resources and flooding risk. Policy ENV2 directs development away from the Coastal Protection Belt as far as practicable. Policy ENV9 guides development towards real improvements in water efficiency and expects developers to go beyond the Code for Sustainable Homes[25] Level 3 (maximum indoor consumption of 105 litres per person per day) with regard to water conservation measures (the highest Levels 5 & 6 are 80 l/person/day).

5.7 Policy ENV3 directs development away from areas at risk of flooding by applying the sequential test and, where necessary, the exceptions test. Most of the new development allocated in the Core Strategy will be accommodated within Flood Risk Zone 1(low probability of river or sea flooding). Policy ENV4 requires that all residential units over 10 units should

[25] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/5976/code_for_sustainable_homes_techguide.pdf

incorporate runoff control via Sustainable Drainage Systems (SUDS) to ensure that the likelihood of flooding is not increased.

5.8 Sustainable water planning and management are guided by European requirements, most notably the Water Framework Directive (EU WFD, 2000) that integrates river basin management and is founded on the principle of good ecological status (GES). A similar approach to integration based on GES was applied to the more recent Marine Strategy Framework Directive (EU MSFD, 2008) and Maritime Spatial Planning Directive (MSPD, 2014). The WFD has been implemented into UK Regulations and with preparation of River Basin Management Plans (RBMPs). A Marine Plan Area (MPA) has been defined by the Marine Management Organisation (MMO) for the English South East inshore area that includes the marine environment associated with the Rochford District area. However, the plan has yet to be prepared and there are no Coastal Partnerships yet listed on the Defra MPA website.

Current Situation: River Basin Management

5.9 The Rochford District area is located within the Anglian RBMP. Each RBMP is sub-divided into WFD management catchments in accordance with river and water body characteristics. Rochford District area is located within the Combined Essex Catchment[26] that extends from Harwich in the north-east to Southend-on-Sea in the south-east and through Essex and parts of Suffolk to the west of Chelmsford and Sudbury.

5.10 The RBMP plans sustainable water management according to ecological status and this includes recording current and predicted ecological and chemical water quality. For those freshwater stretches of the Rivers Crouch and Roach that are monitored, the Environment Agency reports that current ecological status is moderate and predicted to remain moderate in 2015; chemical quality is not required to be assessed with regard to WFD. Therefore, overall, these rivers are at risk of non-compliance with the WFD requirements to achieve good ecological status by 2015. The upper reaches of the River Crouch (south-west of Runwell and just outside the administrative boundary of Rochford District) at the tidal limit are reported as poor quality and no improvement is predicted for 2015. There are no lakes or other significant water bodies within the Rochford District area.

5.11 Groundwater in the Essex Gravels is scattered through the District and currently recorded as of good quantitative quality and predicted to remain good in 2015. However, groundwater chemical quality is currently poor and deteriorating, although predicted to improve to poor status in 2015. This is at risk of non-compliance with WFD in 2015 and is the same as groundwater elsewhere in Essex. The northern and south-western area of the District is mostly within a Surfacewater Nitrate Vulnerable Zone (NVZ) – and this reflects the agricultural use of the land. As with much of Essex and most of the Anglian catchment, this NVZ land area is recorded by the EA as draining to

[26] http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683&y=355134&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=wfd_rivers#x=581494&y=212418&lg=1,2,3,4,7,8,9,&scale=4

priority waters with regard to WFD and the contribution to less than good ecological status is from agricultural use.

Current Situation: Estuarine & Coastal Waters

5.12 The estuarine waters of the River Crouch (extending from south-west of Runwell) and the River Roach (extending from south of Rochford town) meet at the north-eastern point of Foulness Island and then onto the North Sea at Holliwell Point. Small tributaries drain into the River Roach creating islands such as Potton and Havengore and a network of estuarial waterways, marshes and wetlands that characterise the environment of the Rochford District in the east. The RBMP reports current ecological quality for these estuarine waters as moderate and predicted to remain moderate for 2015 and thus at risk of non-compliance with WFD. Current chemical water quality is good and predicted to remain good in 2015.

5.13 It may be noted that the Thames Gateway estuarine waters within the area of Southend-on-Sea (to the south of Rochford) currently have moderate ecological status and fail on chemical quality with no change predicted in 2015 and thus at risk of non-compliance with WFD.

5.14 Coastal waters to the south-east of the District are currently of moderate ecological quality and good chemical quality with no change predicted for 2015 such that there is some risk of non-compliance with WFD. There are no designated bathing waters in the Rochford District area. It may be noted that the 7 of the 8 designated (EU Bathing Water Directive, 2006 – to be revised 2015) bathing waters in Southend-on-Sea to the south meet the higher standard and the eighth meets with the minimum standard.

Current Situation: Water Resources

5.15 Water resources for potable use are not exploited from within the Rochford and South Essex area. Groundwater quality is poor and there are no safeguarded or protection zones designated by the EA for water in South Essex. There are three medium sized groundwater abstractions licensed to the west of Great Wakering and one smaller licence at Barling – all for agricultural purposes. There are two further medium sized groundwater abstraction licenses for golf course irrigation in the centre of the District. There are two large surfacewater abstraction licences for irrigation purposes at the golf courses near Hockley and two large abstractions licensed to the east of Rochford town – again for irrigation of golf courses. There are a further five small licences in the central area of the District for golf course irrigation.

5.16 South Essex relies on water imported from outside the area and is provided by Essex & Suffolk Water; Rochford District is within the Essex Water Resource Zone (WRZ). Water companies are required to set out how they will maintain the balance between supply and demand in Water Resource Management Plans (WRMPs). The Essex & Suffolk Water's (ESW) WRMP[27] covers the period from 2015 to 2040 and was prepared according to Government guidance

[27] https://www.eswater.co.uk/_assets/documents/ESW_Final_Published_PR14_WRMP_Report_-_V3_-_08OCT14.pdf

aiming to address population increase, climate change and environmental needs in some of the driest parts of the country.

5.17 The overall effects of the predicted balance of supply and demand indicate that the Essex WRZ will maintain a surplus of supply across the 25 year planning horizon and negotiations are ongoing with the neighbouring water companies regarding bulk transfer schemes from Essex.

Current Situation: Wastewater

5.18 Anglian Water plc is responsible for the collection of wastewater through the sewerage network and treatment of wastewaters with return of final treated effluent to rivers in accordance with pollution control requirements set by the EA. Wastewater treatment performance is assessed each year by Ofwat and Anglian Water asserted in 2011[28] that they were assessed as meeting with the requirement for maintaining their treatment capability in a "stable condition".

5.19 Wastewater and sewage sludge form a major part of the waste produced in the South Essex area and a study of the capacities of Wastewater Treatment Works (WWTWs) was undertaken to inform the preparation of the Essex Waste Plan (URS for Essex CC & Southend-on-Sea BC, 2014). There are two WWTW catchments within Rochford – Rochford and Rayleigh West. Volumetric capacity assessments did not identify any constraints with regard to proposed development up to 2032. It is noted that the wastewater from additional dwellings planned within Great Wakering will be directed to Southend WWTW, although it is unclear whether an increase in flow consent will meet with the required quality conditions.

5.20 The study identified future capacity beyond 2014 for Rayleigh West WWTW at 4,107 and Rochford WWTW at 4,215 dwellings respectively. The adopted Core Strategy includes 4,600 dwellings to be built between 2001 and 2021 with 250 per year to be built 2010 to 2025 (i.e. 3,750). A potential additional 1,440 dwellings identified in the Joint SHMA (December 2013) between 2025 and 2031 (240 per year) – although it is noted that the SHMA is subject to review – would be accommodated by the future capacity predicted for the two WWTWs. This confirms the findings of earlier studies (2011) on the water cycle with regard to Rochford (and see 5.21-22 below).

5.21 The South Essex Outline Water Cycle Study[29] (WCS, September 2011) was prepared on behalf of Basildon BC, Castle Point BC and Rochford DC to identify any key constraints on development growth planned for the area up to 2031 that may be imposed by the water cycle. The WCS considered the inter-related aspects of water resources, wastewater treatment and transmission, flood risk and sustainable drainage, and ecology. The study concluded that the future potable water needs of the area would be met by the implementation of the Abberton Reservoir Scheme in 2014 and with no adverse effects identified from the increased water resource demands on designated conservation sites.

[28] http://www.anglianwater.co.uk/news/planned-investments/77752E513C814B93895407E102D06307.aspx
[29] http://www.basildon.gov.uk/CHttpHandler.ashx?id=4062&p=0

5.22 The study concluded that the WWTWs at Rayleigh and Rochford have adequate capacity to accept and treat the additional flows from the proposed level of growth. Assessment of the ecological impacts of increased wastewater discharges from the proposed growth concluded that there would be no adverse effects on designated conservation sites. It may be noted that neighbouring WWTWs at Basildon, Billericay, Southend-on-Sea and Wickford are at capacity. However, it is unclear whether the later WWTW capacity studies reporting in 2014 (see 5.20 above) confirmed these findings for neighbouring authorities.

5.23 Effluent from the two WWTWs discharge into the River Crouch that does not require assessment for chemical water quality under WFD; ecological quality is moderate and at risk of non-compliance with the WFD. It is assumed that this is due to agricultural runoff and nutrient enrichment from nitrates, not from WWTW effluent.

Current Situation: Flood Risk

5.24 Most of the east of the Rochford District is at risk of flooding located within Flood Risk Zone 3 (FRZ) (high risk). As shown by Figure 05a, this includes; the land in the immediate vicinity of the River Roach, the majority of Paglesham, the east of Great Wakering, and the land below the River Crouch. The River Roach flood zone extends west of Rochford, and into Hawkwell following the tributaries.

5.25 A Strategic Flood Risk Assessment (SFRA) [30] for Rochford District (February 2011) states that parts of the District are at significant risk of flooding from tidal sources. Overtopping or a breach in the flood defences has the potential to result in flooding to depths of greater than 3m throughout Shoeburyness, Paglesham, Wallasea Island and South Farmbridge, putting existing development and occupants at great risk. Given the low lying nature of the coastline (see Figure 02 Topography) in this part of the District, flood waters are likely to propagate rapidly, greatly reducing the time available for warning and evacuation of residents (as was the case in the 1953 flood).

5.26 The Essex and South Suffolk Shoreline Management Plan[31] (SMP, 2010) includes management Unit H the Crouch and Roach Estuaries, and Unit I Foulness, Potton, Havengore and Rushley Islands. The SMP intends to provide continued defence for all dwellings currently at risk of flooding and erosion including the low-lying areas of major settlements such as Rochford. Current policy is to hold the line and the standard of protection will be maintained or upgraded.

5.27 In addition to flood risk from tidal sources, fluvial systems also pose a risk to parts of the Rochford District. The impermeable underlying geology and seasonally wet, deep clay soils in the western parts of the District lead to rapid runoff of surface water into local watercourses. The channelisation of these watercourses increases the rapid conveyance of water downstream and

[30] Rochford District Council (2011) Strategic Flood Risk Assessment [online] http://www.rochford.gov.uk/sites/rochford.gov.uk/files/documents/files/ldf_evibase_flood_1_78.pdf
[31] http://www.eacg.org.uk/docs/smp8/essex&southsuffolk%20smp%20final%202.4.pdf

leads to problems where watercourses converge. Fluvial flooding primarily affects Rochford town where the Rivers Roach, Nobles Green Ditch and Eastwood Brook meet. A number of smaller watercourses in Rawreth and Rayleigh also pose a fluvial flood risk. Fluvial and tidal flood risk is shown in Figure 06a and surfacewater flood risk in Figure 05b.

5.28 The South Essex Catchment Flood Management Plan[32] (CFMP, 2010) recognises five Sub-Areas within the Rochford District and directs future flood risk management for the area. It is acknowledged that flood risk is likely to increase and that the protection given by defences may decline such that improving maintenance is important.

5.29 The Rochford and Hockley areas are prioritised as Tier 1 (more than 1000 people predicted to be at risk) locally important surfacewater risks in the Essex Local Flood Risk Management Strategy[33] (LFRMS, 2013). A South Essex Surface Water Management Plan (SWMP) for Basildon, Castle Point, and Rochford councils has been prepared[34]. Flood defences are found in Rochford town, north of Ashingdon along the River Crouch, along the south bank of the River Roach, around the tributary running through Great Stambridge, through Paglesham, across Wallasea Island and along the River Crouch and the River Roach borders of Foulness Island.

5.30 Wallasea Island (in the east of the District) is subject to a long-term managed realignment programme that seeks to provide water with sufficient flooding space, and recede flood barriers to enhance intertidal habitats that are shrinking as a result of historic land take, climate change and coastal erosion. Water providing habitats and recognised for biodiversity values are discussed within the Biodiversity theme in the next section 6.

5.30 The South Essex Outline Water Cycle Study advised that opportunities for providing SUDS (sustainable drainage systems) are limited by the largely impermeable geology underlying most of the study area. New development within Castle Point and Basildon should provide attenuation of surface water run-off, although infiltration may be possible in some areas of the Rochford District.

Summary of Key Issues Arising from Baseline Information:

- Ecological status of upper reaches of Rivers Crouch & Roach are moderate quality and at risk of non-compliance with WFD in 2015
- Estuarine waters and coastal waters to the south-east of the District are of good chemical quality and moderate ecological quality with some risk of non-compliance with WFD in 2015; there are no designated bathing waters

[32] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/288893/South_Essex_Catchment_Flood_Management_Plan.pdf
[33] http://www.essex.gov.uk/Publications/Documents/Local_Flood_Risk_Management_strategy.pdf
[34] http://www.essex.gov.uk/Environment%20Planning/Environmental-Issues/local-environment/flooding/Flood-water-management-strategies/Pages/Surface-Water-Management-Plan.aspx

- Surplus of supply in Essex Water Resource Zone - water resources are adequate for proposed and additional growth, and without any adverse effects on ecological quality
- Two WWTW catchments within Rochford – Rochford and Rayleigh West; volumetric capacity assessments (2014) did not identify any constraints with regard to proposed development up to 2032; earlier Water Cycle Study (2011) had identified issues for proposed development in the Great Wakering area flowing into the Southend-on-Sea WWTW that is at capacity and there may be issues for meeting with quality consent conditions. There appears to be some uncertainty with regard to the capacities of WWTWs in the South Essex area and meeting discharge consent quality
- Much of the District is at significant risk from either fluvial or tidal flooding. Rochford and Hockley areas prioritised as Tier 1 locally important surfacewater risks in Essex LFRM (2013)
- Impermeable geology structure in the west of the District limits opportunities for SUDS
- Age, strength, and appropriateness of existing flood defences: Essex & South Suffolk SMP policy is to hold the line with maintaining or upgrading defences; South Essex CFMP expects flood risk to increase, defence protection may be less - so that improving maintenance is preferred approach

Effects of Development

Table 5.2: Impact Types and Potential Effects on Water

Impact Types	Effects on Water
▪ Increased water resources demands	Over-abstraction with loss of resources Effects on biodiversity
▪ Increased wastewater; flows exceeding capacity of sewerage system and treatment works	Reduction in water quality – chemical and ecological
▪ Increased amount of impermeable surfaces with increased surfacewater run-off placing demands on existing flood defences	Increased flood risk Potential reduction in water and ecological quality Development could potentially help to reduce flood risk in some situations

Sensitivity, Significance and Capacity

5.32 Rochford is located in one of the driest parts of England but the Essex Water Resource Area has a surplus of water supply, primarily due to the implementation of the Abberton Reservoir Scheme, and there will be capacity for accommodating development growth up to 2040. The sustainability of water resource management is debateable with regard to boundaries for assessing capacities. The current approach endorses the acceptability of transporting water from areas of surplus to areas of need. The

capacity of the water environment to accept these changes with regard to chemical and ecological quality is considered through the conditions set by the Environment Agency for abstraction licences and discharge consents.

5.33 The current ecological quality of the rivers and estuarine waters is moderate and at risk of not achieving good ecological status (and thus not complying with the EU Water Framework Directive) in 2015. It is understood that this is primarily as a result of nutrient rich run-off from agricultural use of fertilisers – and thus not within the scope of spatial and development planning.

5.34 Increased wastewater arising from increased development can exacerbate water quality issues by overloading the flow through WWTWs with subsequent adverse effects on the quality of the treated wastewater discharged to river or estuarine waters. Two studies (WCS for Rochford, Castle Point & Basildon Councils, 2011and WWTW capacity for emerging Essex Waste Plan, 2014) for the South Essex area indicate capacities for wastewater transport and treatment in Rochford and surrounding areas.

5.35 The WCS in 2011 considered implications for Rochford District, Castle Point and Basildon Councils; the study in 2014 undertaken of WWTW capacities in Essex also considered the other authorities that are neighbouring to Rochford – Chelmsford, Maldon and Southend-on-Sea. This latter study did not identify any volumetric constraints for known proposed development up to 2040 with associated increased wastewater and sludge. However, the study did comment that the implications of increased flow with regard to quality were unknown.

5.36 Management and planning of wastewater infrastructure is increasingly aware of a more sustainable approach and based on ecosystem services. However, the location of the current WWTWs reflects previous approaches. Capacity studies consider the volumetric capacity of the systems to collect, transport and treat wastewater with limited consideration of the impacts on the receiving waters. Therefore, there is some uncertainty about the capacities of WWTWs and the significance of effects on water ecosystems particularly with regard to ecological quality.

5.37 The eastern half and the northern edge of the Rochford District area, in predominantly undeveloped rural areas, are characterised by a high risk of tidal and fluvial flooding with no capacity for accommodating additional development – unless the proposals are designed with water neutrality and do not contribute any surfacewater run-off. The western, mostly developed, half of the District has some limited capacity with regard to flood risk. Opportunities for SUDS are limited due to the underlying geology but there are likely to be some site specific locations that are suitable and sustainable for smaller housing proposals.

5.38 Mitigation and adaptation for the effects of climate change, including flood risk, arising from carbon emissions is embedded in Government and spatial planning policy. Carbon emissions and climate change is considered earlier in this report in section 3 Air. The carbon emissions from increased vehicle use associated with the anticipated additional housing developments will not

have any significant effects on flood risk. The water capacity analysis is provided in the table following.

Table 5: Water (See Figure 06a & b)		
Summary: In one of driest parts of England Ecological quality of rivers and estuarine waters at risk of non-compliance with Water Framework directive for 2015 Capacity of wastewater network and treatment works for Rochford and the South Essex sub-regional area may have some uncertainty with regard to water quality. Low-lying and susceptible to both fluvial and tidal flooding. Current policy is to maintain tidal coastal defences.		
Water Resources Sensitivity: Low	**Likely Impacts & Significance**	**Capacity: High**
In one of the driest areas of England but water resources planning is over a long period of time and major transfers are possible between sub-regional areas.	Increased demand on water supply but significance can be mitigated by availability of supply from outside the area – but within the Essex Resource Zone? – and provision of sustainable water management (including water neutrality) in new development	ESW WRMP asserts that water in the Essex WRZ will maintain a surplus of supply to 2040
Water Quality Sensitivity: Medium - Low	**Likely Impacts & Significance**	**Capacity: Medium – Low**
Current ecological quality for rivers and estuarine waters is moderate and at risk of non-compliance with WFD for 2015. Coastal WQ is good ecological quality.	Increased discharge of effluent from increased wastewater and/or overloading of capacities of WWTWs could reduce ecological quality further – unlikely as subject to flow and quality consent conditions by EA	South Essex study (2014) into WWTWs capacity indicated no identified constraint up to 2032; no increased effluent discharge beyond licensed volume; unclear whether increase in flow consent will meet quality conditions
Wastewater Treatment & Sewerage Sensitivity: Medium	**Likely Impacts & Significance**	**Capacity: Medium – Low**
Capacity for wastewater transport and treatment uncertain and would require phasing for infrastructure investment	Two WWTW catchments within Rochford – Rochford and Rayleigh West. Volumetric capacity assessments (South Essex study 2014) did not identify any constraints with regard to proposed development up to 2032. Additional dwellings at Great Wakering will be directed to Southend WWTW but there may be an issue regarding meeting with quality conditions.	South Essex study (2014) into WWTWs capacity indicated no identified constraint up to 2032; unclear whether increase in flow consent will meet quality conditions at WWTWs in neighbouring authorities – Southend Borough

Flood Risk Sensitivity: High & Medium	Likely Impacts & Significance	Capacity: Low & Medium
Most of east and much of the northern edge are in FRZ3 with significant risk from tidal and fluvial flooding; tidal flood risk likely to increase.	Current policy is to maintain tidal protection – except for Wallasea Island that has a long-term managed realignment programme Some difficulty to mitigate risk of surfacewater flooding through SUDs as the underlying geology is impermeable, although some SUDs are appropriate.	Areas to north and east have no capacity with regard to flood risk. Developed areas in western half of district may have some limited capacity that will be site-specific.

6.0 BIODIVERSITY

Introduction

6.1 Biodiversity (flora and fauna) is an essential part of complex and interconnected natural systems that are inter-dependent on the other themes being considered through this study (air, water & soil). Biodiversity provides a number of services that are fundamental for human life and wellbeing – it is important to remember that our own species *Homo sapiens* is an integral component of biodiversity. These services are summarised in the table below.

Table 6.1: Ecosystem Services provided by Biodiversity

Provisioning Services *The products obtained from ecosystems.*	**Regulating Services** *The benefits obtained from the regulation of ecosystem processes.*	**Cultural services*** *The non-material benefits people obtain from ecosystems.*
▪ Food (meat, fish, grains, vegetables, fruits etc) ▪ Genetic resources (crop varieties and medicines) ▪ Raw materials (wood, organic matter, fertiliser etc)	▪ Carbon sequestration ▪ Waste decomposition ▪ Purification of air and water ▪ Pest and disease regulation ▪ Reducing flood risk ▪ Pollination	▪ Cultural, Aesthetics and Inspiration ▪ Recreation, tourism and amenity ▪ Science and education ▪ Human health and well-being ▪ Social values
Supporting Services *Ecosystem services that are necessary for the production of all other ecosystem services.*		
	▪ Nutrient cycle ▪ Photosynthesis ▪ Habitat provision ▪ Soil formation ▪ Primary production	

6.2 Biodiversity is inherently linked to the other themes being considered through this study and the services they provide. The character of the underlying geology, soils, water and landscape, have shaped the biodiversity characteristics of the Rochford and South Essex area. Good air, soil and water quality are all important factors in maintaining this character together with the integrity of habitats and population of species. The regulating services provided by biodiversity help to maintain and improve the quality of the air, soil and water. Changes to biodiversity, including the other themes, can influence the supply of ecosystem services and benefits they provide.

Policy Context

6.3 There is a wide range of international and national statutory designations protecting the natural environment from development. The Habitats Directive[35] (92/43/EEC) establishes a network of internationally important sites designated for their ecological status. These are referred to as Natura 2000 sites or European Sites, and comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) which are designated under European Directive (2009/147/EC) on the conservation of wild birds [the Birds Directive][36]. In addition, the NPPF also requires that potential SPAs, possible SACs and listed or proposed Ramsar sites (which support internationally important wetland habitats and are listed under the Convention on Wetlands of International Importance [Ramsar Convention[37]]) should also be given the same protection as European sites.

6.4 The Wildlife and Countryside Act 1981[38] consolidated and amended national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC (now 2009/147/EC) on the conservation of wild birds (Birds Directive) in Great Britain. The Act placed a duty on nature conservation agencies to notify any area of land which in their opinion is 'of special interest by reason of any of its flora, fauna, or geological or physiographical features'. These areas are known as Sites of Special Scientific Interest (SSSIs) and represent the very best wildlife and geological sites in the UK.

6.5 The Natural Environment and Rural Communities (NERC) Act 2006[39] modernised and simplified arrangements for delivering Government Policy to help achieve a rich and diverse natural environment and thriving rural communities. The Act established the independent body; Natural England which is a statutory consultee in the development process, along with improvements to other governance arrangements, including for National Parks and within the Joint Nature Conservation Committee (JNCC). Section 41 and 42 of the Act identifies Priority Species and Habitats in England and Wales of principal importance for the purpose of conserving biodiversity.

6.6 The NPPF states (paragraph 7) that the planning system must perform a number of roles to provide sustainable development. This includes an environmental role in contributing to the protection and enhancement of the natural environment and improving biodiversity. It sets out that the planning system should contribute to and enhance the local environment by recognising the wider benefits of ecosystem services, minimising impacts on biodiversity and providing net gains in biodiversity where possible. It must contribute to the Government's commitment to halt the overall decline in

[35] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Available online: http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm
[36] Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds. Available online: http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm
[37] http://www.ramsar.org/
[38] http://www.legislation.gov.uk/ukpga/1981/69/contents
[39] http://www.legislation.gov.uk/ukpga/2006/16/contents

biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures (paragraph 109).

6.7 Local planning authorities need to plan positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure (NPPF, paragraph 114). Planning policies should plan for biodiversity at a landscape-scale across local authority boundaries as well as promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations (NPPF, paragraph117).

6.8 When determining planning applications local planning authorities should aim to conserve and enhance biodiversity by refusing planning permission if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for. Planning permission should be refused if there is likely to be an adverse effect on internationally or nationally designated areas or result in the loss or deterioration of irreplaceable habitats. An exception should only be made where the benefits of the development, at the site, clearly outweighs the potential adverse effects (NPPF, paragraph 118).

6.9 The overall vision set out in the adopted Core Strategy[40] seeks to protect the District's distinctive character as well as enhance its role as the green part of the Thames Gateway South Essex. It also seeks to progress green tourism initiatives and rural diversification to provide sustainable opportunities for businesses whilst maintaining a high quality environment. For example, the Wallasea Island Wild Coast project is a landmark conservation and engineering scheme that aims to help mitigate effects of climate change and coastal flooding by re-creating the ancient wetland landscape of mudflats and saltmarsh, lagoons and pasture. On completion in 2019 it will protect important wildlife and provide particular recreational services for people.

6.10 The Core Strategy (Policy ENV1) seeks to maintain, restore and enhance sites of international, national and local nature conservation importance. It also seeks (Policy ENV2) to protect and enhance the wildlife qualities of the coastline and ensure that development does not affect the open and rural character or wildlife within the Coastal Protection Belt. Policy URV1 of the Core Strategy supports the recognition of the Upper Roach Valley as a vast 'green lung' within the District and as an area providing informal recreation opportunities for local residents. This recognises the importance of this area as part of the wider green infrastructure network.

6.11 The adopted Allocations Plan[41] identifies the sites to be designated for local wildlife importance in the District (Policy ELA1). It also identifies the area to be designated as the Coastal Protection Belt (Policy ELA2) and seeks to

[40] Rochford District Council Core Strategy adopted 13 December 2011). Available online: http://www.rochford.gov.uk/planning/policy/local_development_framework/core_strategy_dpd1
[41] Rochford District Council Allocations Plan (adopted 25 February 2014). Available online: http://www.rochford.gov.uk/planning/policy/local_development_framework/allocations_development_plan-1

protect and enhance it in accordance with the Core Strategy Policy ENV2. The Allocations Plan also allocates an area in the Upper Roach Valley in order to protect it from development that would undermine its role as a green space for informal recreation - in accordance with Core Strategy Policy URV1. It contains seven of the fourteen ancient woodlands found in the District as well as a number of Local Wildlife Sites. Greenspaces are part of the green infrastructure as a key element of ecosystems services and is included in the Thames Gateway Parklands[42] programme as a collaboration between 3 local green networks: the East London Green Grid, South Essex Green Grid, and Greening the Gateway Kent & Medway. Green Infrastructure can be broadly defined (EU, 2013) as a strategically planned network of high quality natural and semi-natural areas with other environmental features, which is designed and managed to deliver a wide range of ecosystem services and protect biodiversity in both rural and urban settings.

Current Situation: Internationally Important Biodiversity

6.12 There are five European sites within the administrative boundary of Rochford District - the Crouch and Roach Estuaries SPA and Ramsar, Foulness SPA and Ramsar and Essex Estuaries SAC (See Figure 06a). Natural England have produced a Site Improvement Plan (SIP) for the Natura 2000 sites within the Essex Estuaries, which includes Blackwater Estuary (Mid-Essex Coast Phase 4) SPA, Colne Estuary (Mid-Essex Coast Phase 2) SPA, Crouch & Roach Estuaries (Mid-Essex Coast Phase 3) SPA, Dengie (Mid-Essex Coast Phase 1) SPA, Essex Estuaries SAC, Foulness (Mid-Essex Coast Phase 5) SPA[43]. The SIP identifies the following priority and key issues in relation to the Essex Estuaries:

- Coastal squeeze
- Public Access/ Disturbance
- Fisheries: Commercial marine and estuarine
- Planning Permission: general
- Changes in species distribution
- Invasive species
- Fisheries: both recreational and commercial marine/estuarine
- Air pollution: risk of atmospheric nitrogen deposition

6.13 Where a SPA or SAC is continuously or intermittently covered by tidal waters, the site is referred to as a European Marine Site. The marine components of the European sites identified above are being treated as a single European Marine Site called the Essex Estuaries European Marine Site (EEEMS). Effectively the whole of the District's coastline is within the EEEMS, although terrestrial parts of the SPAs (i.e. freshwater grazing marshes inside the sea walls) are not included as they occur above the highest astronomical tide.

6.14 The Essex Estuaries SAC is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. The site comprises the major estuaries of the Colne, Blackwater, Crouch and Roach Rivers and is important as an extensive area of contiguous estuarine habitat.

[42] http://segip.org/sub_regional_network/
[43] NE (2015) Site Improvement Plan Essex Estuaries. Available online: http://publications.naturalengland.org.uk/publication/5459956190937088

It contains a very wide range of characteristic and unusual marine species as well as large areas of saltmarsh and other important coastal habitats. The qualifying features of the Essex Estuaries SAC are[44]:

- Estuaries
- Mudflats and sandflats not covered by seawater at low tide
- Salicornia and other annuals colonising mud and sand
- Spartina swards (*Spartinion maritimae*)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)
- Sandbanks which are slightly covered by sea water all the time

6.15 These habitats support a large number of waterfowl as well as wide range of important bird species for which the SPAs are designated. These include[45]:

- Hen Harrier (*Circus cyaneus*)
- Dark-bellied brent goose (*Branta bernicla bernicla*)
- Avocet (*Recurvirostra avosetta*)
- Little Tern (*Sterna albifrons*)
- Common Tern (*Sterna hirundo*)
- Sandwich Tern (*Sterna sandvicensis*)
- Bar-tailed Godwit (*Limosa lapponica*)
- Ringed Plover (*Charadrius hiaticula*)
- Red Knot (*Calidris canutus*)
- Eurasian Oystercatcher (*Haematopus ostralegus*)
- Grey Plover (*Pluvialis squatarola*)
- Common Redshank (*Tringa totanus*)

6.16 There is no information available with regard to the current conservation status or condition of the individual European sites within the District. Member States are required to report every six years on the progress made with the implementation of the Habitats Directive. This covers the general implementation of the Directive as well as the conservation status of individual habitats and species listed under the Annexes of the Directive. The 3rd UK Habitats Directive Report was submitted to the European Commission in 2013[46]. The table below outlines the conservation status and overall trend for the habitats that are qualifying features for the Essex Estuaries SAC.

[44] JNCC - Protected Sites. Essex Estuaries. Available online: http://jncc.defra.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0013690
[45] JNCC -Protected Sites. Crouch and Roach Estuaries SPA and Foulness SPA. Available online: http://jncc.defra.gov.uk/page-1401
[46] General Implementation Report - 3rd UK Habitats Directive Reporting 2013. Available on JNCC website: http://jncc.defra.gov.uk/article17

Table 6.2: Conservation Status & Overall Trend for European protected Habitats

Habitat Name	Conservation Status & Overall Trend 2007	Conservation Status & Overall Trend 2013	Main Reason for Change
Estuaries	Bad - Deteriorating	Bad - Declining	No change
Mudflats and sandflats not covered by seawater at low tide	Bad - Deteriorating	Bad - Improving	Genuine change: the overall conservation status improved due to natural or non-natural reasons (management, intervention, etc.)
Salicornia and other annuals colonising mud and sand	Bad - Deteriorating	Bad - Stable	As above
Spartina swards (*Spartinion maritimae*)	Bad - Deteriorating	Bad - Stable	As above
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	Bad - Deteriorating	Bad - Stable	As above
Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	Inadequate - Deteriorating	Bad - Improving	As above
Sandbanks which are slightly covered by sea water all the time	Bad - Deteriorating	Inadequate - Stable	Change observed is due to use of different methods to measure or evaluate individual parameters or the overall conservation status

The 3rd UK Report concludes that across the UK the conservation status for these habitats is poor. It shows that since 2007 there have been improvements and that the overall trend for the majority of habitats is now either stable or improving. The exception to this is the Estuary habitat, which is still in decline.

6.17 Member States are also required to report on the implementation of the Birds Directive. The 10th UK Report for Article 12 of the EU Birds Directive for the

period 2008-2012 was submitted to the EC in January 2014[47]. The table below presents the population trend information available as part of that report, for those bird species designated under the Crouch and Roach Estuaries SPA and Foulness SPA.

Table 6.3: Bird Population Trends

Species Name	Short-term trend (last 12 years)	Long-term trend (since c. 1980)	Main Pressures & Threats
Hen Harrier (*Circus cyaneus*)	Stable	No information available	No threats or pressures
Dark-bellied brent goose (*Branta bernicla bernicla*)	No information available	No information available	No information available
Avocet (*Recurvirostra avosetta*)	Stable	No information available	No threats or pressures
Little Tern (*Sterna albifrons*)	Stable	No information available	Recreational pressure and predation
Common Tern (*Sterna hirundo*)	Stable	No information available	No threats or pressures
Sandwich Tern (*Sterna sandvicensis*)	Stable	Stable	Oil spills in the sea and leisure fishing
Bar-tailed Godwit (*Limosa lapponica*)	No information available	No information available	No information available
Ringed Plover (*Charadrius hiaticula*)	No information available	No information available	No information available
Red Knot (*Calidris canutus*)	No information available	No information available	No information available
Eurasian Oystercatcher (*Haematopus ostralegus*)	Stable	No information available	No threats or pressures
Grey Plover (*Pluvialis squatarola*)	No information available	No information available	No information available
Common Redshank (*Tringa totanus*)	No information available	No information available	No information available

6.18 The findings of 10th UK Report[48] indicate that the short-term population for five of the bird species is stable. Long-term population trends were only available

[47] 10th UK Report for Article 12 of the EU Birds Directive for the period 2008-2012. Available on JNCC website: http://jncc.defra.gov.uk/default.aspx?page=6526
[48] Ibid.

for the Sandwich Tern and these are stable. For six of the species there was no trend information available in the short or long-term.

6.19 The Wetland Bird Survey (WeBS) monitors non-breeding waterbirds in the UK, identifying population sizes and determining trends in numbers and distribution.

6.20 The most recent national survey of the Hen Harrier carried out by the RSPB, revealed that that there has been a 20% decline in the bird's UK and Isle of Man population in just 6 years[49]. There were 617 breeding pairs in the UK in 2010[50] and the majority of these were located in Scotland (489 pairs). In England, the Hen Harrier remains extremely close to extinction, with just 12 pairs located in 2010[51]. The Special Protection Areas within Rochford are designated for their wintering population of Hen Harrier only.

6.21 As well as birds, it should also be noted that there are records of other European species being present within the District; these include the European Eel (*Anguilla anguilla*) and the European Smelt (*Osmerus eperlanus*) (and see Figure 04b).

6.22 Natural England undertook a strategic review of risks from all ongoing activities within European Marine Sites (EMSs) in 2010, in order to identify and prioritise action required to meet conservation objectives. The review classed activities as those which could pose a high, medium, low or no risk to EMSs, which includes the Essex Estuaries EMS[52].

6.23 As part of the risk assessment, a preliminary high level overview of activities found that the condition of the Essex Estuaries EMS is unfavourable and is known to be affected by coastal squeeze. This occurs when coastal habitats become caught between sea defences and rising sea levels. The final risk assessment results found that coastal squeeze and commercial fishing (Oyster Trestles) pose a medium to low risk for the Essex Estuaries EMS. The assessment did not identify any other activities, such as pollution, water abstraction or recreation, as possibly posing a risk.

Current Situation: Nationally Important Biodiversity

6.24 There are three SSSIs in the District, located at Hockley Woods, Foulness and the Crouch and Roach Estuaries (See Figure 06a). The condition of these SSSIs, which is monitored and assessed by NE, is set out in the table below.

[49] RSPB Website. Available online: http://www.rspb.org.uk/news/details.aspx?id=273005
[50] RSPB - Hen Harrier Profile. Available online: https://www.rspb.org.uk/discoverandenjoynature/discoverandlearn/birdguide/name/h/henharrier/
[51] RSPB Website. Available online: http://www.rspb.org.uk/news/details.aspx?id=273005
[52] NE (2011) European Marine Site Risk Review. Available online: http://publications.naturalengland.org.uk/publication/36006

Table 6.4: SSSI Condition Summary[53]

SSSI Name	Hockley Woods	Foulness	Crouch and Roach Estuaries
Condition Summary			
% Area meeting PSA target	100.00%	97.28%	99.33%
% Area favourable	100.00%	72.61%	22.87%
% Area unfavourable recovering	0.00%	24.68%	76.46%
% Area unfavourable no change	0.00%	0.02%	0.67%
% Area unfavourable declining	0.00%	2.70%	0.00%
% Area destroyed / part destroyed	0.00%	0.00%	0.00%

6.25 The SSSIs within the District are generally in a favourable or unfavourable recovering condition. There is a single unit within the Foulness SSSI that is currently assessed by Natural England as being unfavourable declining as grazing has ceased, which has allowed the over-dominance of rough grassland with limited structural diversity and unsuitable habitat for overwintering grazing wildfowl, notable vascular plants and invertebrate assemblage[54]. Overall, the condition of SSSIs within the District has been improving in recent years and this is considered unlikely to change in the future, unless there are any significant changes with regard to the management of the land. The improved conditions of Foulness SSSI and the Crouch and Roach Estuaries SSSI in 2010 are due[55] to the commencement of habitat re-creation within the Essex Estuaries complex.

Current Situation: Locally Important Biodiversity

6.26 There are no National Nature Reserves (NNRs) in the District; however, there are four Local Nature Reserves (LNRs) covering a total area of approximately 105 hectares[56] (See Fig 06b). Local Nature Reserves encompass habitats of local significance that contribute both to nature conservation and provide opportunities for communities to see learn about and enjoy wildlife. The LNRs within the District include Hockley Woods (91 hectares), Hullbridge Foreshore (4 hectares), Marylands (3.69 hectares) and Magnolia Fields (9.7 hectares).

6.27 There are 39 Local Wildlife Sites (LWSs) within the District, which are mostly designated for woodland (approximately 54%[57]), but also comprise areas of

[53] Natural England. Sites of Special Scientific Interest. Available online: http://www.sssi.naturalengland.org.uk/special/sssi/search.cfm
[54] Natural England. Sites of Special Scientific Interest - Foulness SSSI. Available online: http://www.sssi.naturalengland.org.uk/special/sssi/search.cfm
[55] Essex County Council Strategic Environmental Assessment Baseline for RDC, 2010
[56] Rochford District Council. Annual Monitoring Report 2012-13. Available online: http://www.rochford.gov.uk/planning/policy/local_development_framework/evidence_base/annual_monitoring_reports
[57] Rochford District Council (2007) Rochford District Local Wildlife Site Review. Available online: http://www.rochford.gov.uk/planning/policy/local_development_framework/evidence_base

grassland, mosaic, coastal and freshwater habitats[58]. The largest of all the LWSs is the Wallasea Island Managed Realignment area, which covers an area of 90.3 hectares. Other significant Local Wildlife Sites include Magnolia Nature Reserve and Fields to the west of Ashingdon (29.2 hectares) and Wakering Landfill Site to the north east of Great Wakering (24 hectares). LWSs cover just over 377 hectares within the District and, for example, include Kingley Woods – a small area that is one of the only surviving ancient woodlands in Rayleigh and with a rich and varied wildlife.

6.28 Geographically there is a strong concentration of LWSs around Hockley, Rayleigh and Hawkwell, the most wooded part of the District, with a corresponding absence in the more agricultural parishes of Canewdon, Stambridge and Sutton (See Figure 06b). The coastal belt is also well represented, although the vast majority of habitat in that zone is within European sites and/ or SSSIs.

6.29 There are 14 areas of Ancient Woodland in Rochford District, half of which lie in the Upper Roach Valley (See Figure 06b). These are areas that are believed to have had a continuous woodland cover for at least 400 years and therefore have higher conservation value than woodland that has developed recently. Hockley Woods contains the largest area of ancient semi-natural woodland at more than 100 hectares and contains more ancient woodland plants than any other wood in the Country[59].

6.30 There are also important areas containing the priority habitat - traditional orchards[60]. These orchards contain a great variety of fruit cultivars, managed in a low intensity way. They provide local food production, promote self-containment, provide habitats for birds, invertebrates and small mammals, and hold the main genetic resource of old local fruit varieties that have otherwise virtually disappeared from production (predominantly apples). In 2008, the East of England Apples and Orchards Project (EEAOP) with the Essex Biodiversity Project undertook a countywide survey of orchards within Essex, which found that 97% of the existing orchards were found across just six Districts, including Rochford, and only 2% showed an increase in areas, compared to 40% which showed a reduction in area.

6.31 The Essex Biodiversity Action Plan[61] (EBAP) is focused on 19 Priority Habitat Types, as well as the list of Priority Species and Habitats provided for in Section 41 of the 2006 Natural Environment and Rural Communities Act. The Rochford Biodiversity Action Plan (RBAP) sets out actions and targets for the following habitats and species:

[58] Rochford District Council. Annual Monitoring Report 2012-13. Available online: http://www.rochford.gov.uk/planning/policy/local_development_framework/evidence_base/annual_monitoring_reports
[59] Rochford District Council - SEA Baseline Information Profile 2009-2010. Available online: http://www.rochford.gov.uk/planning/policy/local_development_framework/evidence_base
[60] Essex Biodiversity Action Plan 2010 - 2010 (2011). Available online: http://www.essexbiodiversity.org.uk/biodiversity-action-plan
[61] ibid

Birds
- Grey Partridge
- Skylark
- Thrush
- Corn Bunting
- Lapwing
- Turtle Dove
- Yellow Wagtail

Invertebrates
- Heath Fritillary

Mammals
- Brown Hare
- Dormouse
- Harbour Porpoise
- Water Vole

Habitats
- Ancient or species rich hedgerows and green lanes
- Ancient Woodland
- Coastal Grazing Marsh
- Seagrass Beds
- Saline Lagoons
- Urban Areas

Plants
- Native Black Poplar

Other
- Great Crested Newt

It is noted that this does not include traditional orchards, perhaps acknowledging that remaining Essex orchards are found in Rochford and targets are not needed here. Other rare and protected species that have been recorded within the District include the European Eel (*Anguilla anguilla*) and European smelt (*Osmerus eperlanus*) (See Figure 06b and paragraph 6.19 above).

6.32 In 2013, Natural England published a new priority habitats' inventory[62] covering 24 habitats moving from the previous multiple habitat layers to the a single layer based on the Rural Land Registry. This aligns with the 2011 UK Framework that replaces the UK BAP and sets priorities at the county level, for example, through Biodiversity 2020[63]. Most traditional orchards are non-SSSI and not under Higher Level Stewardship management with condition unknown. For those that are within SSSIs, about 70% are in favourable condition and some 22% in unfavourable recovering condition (accessed January 2015). Such a rarer habitat makes up only less than 1% of the total resource for priority habitats in England – and most are outside of protected areas.

6.33 The Living Landscapes[64] map prepared by Essex Wildlife Trust and partners sets out key biodiversity networks by habitat: Coastal & Estuarine; Wetland; Woodland; Mosaic & Grassland; and Corridor. The Rochford District area includes the following key biodiversity networks of habitats:

- No 45 Crouch & Roach Estuary
- No 49 Southend Seafront & Maplin Sands
- No 50 Thames Medway Gravels South
- No 79 Foulness Islands

[62] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/382483/2a._priority_habitats2a_2014_final.pdf

[63] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf

[64] http://www.essexbiodiversity.org.uk/app/webroot/files/Maps/LL_map_1.1MB.jpg

6.34 This Living Landscape approach aligns with larger scale landscapes that also encompass Green Infrastructure and provide a network of key habitats based on their current ecological value and potential for improvement. The Wallasea Wild Coast project[65] sits within the Greater Thames Futurescape and will cover over 600 hectares when completed. Overall, this landscape-scale conservation initiative covers an area from the inner Thames to Margate in the south and beyond Clacton in north Essex. This project aims to deliver large scale habitat creation and species conservation, whilst providing an attractive and inspirational area for people to visit.

6.35 Parks & Gardens, natural, semi-natural & amenity green spaces, including outdoor sports grounds, allotments and cemeteries, are all important for biodiversity, wildlife conservation, and can provide informal recreation and amenity facilities. Many of the important natural and semi-natural greenspaces (woodlands, grasslands, wetlands, open & running water and nature reserves), are linked by footpaths and bridleways, and they are valuable for conserving biodiversity and contributing to the sustainability of ecosystems. In this section 6, the role of such locally important biodiversity to the overall sustainability of ecological ecosystems is considered. The role of these green spaces for human health through recreation and amenity are considered in the following section 7 on People (Health & Well-being, Landscape, Recreation, Cultural Heritage & Historic Environment).

6.36 Biodiversity indicators currently being monitored by the Council include the condition of SSSIs (based on monitoring carried out by NE) and hectares of land within Rochford District by designation, which includes NNRs, LNRs and LWSs[66].

6.37 The Rochford internationally designated coastal and estuarine areas are an important part of the recently defined Nature Improvement Area (NIA) (one of only 12 funded NIA partnerships in the UK)-the Greater Thames Marshes[67]. This is considering the pressures that are impacting on the current and future ecological functionality of the NIA, recognising the need for planning and management at a more appropriate wider landscape-scale.

6.38 The Biodiversity 2020 Strategy[68] set out a number of priority actions and high-level outcomes to halt biodiversity loss and support healthy well-functioning ecosystems and establish coherent ecological networks. Outcome 1A sets a target that by 2020 at least 50% of SSSIs will be in favourable condition, while maintaining at least 95% in favourable recovering condition. As shown in Table 6.4 the SSSIs within the District are already meeting this target with the two out of the three SSSIs having a favourable condition status. The Crouch and Roach Estuaries SSSI is only 22.87% favourable; however, 76.46% of the

[65] https://www.rspb.org.uk/discoverandenjoynature/seenature/reserves/guide/w/wallaseaisland/
[66] Rochford District Council. Annual Monitoring Report 2012-13. Available online: http://www.rochford.gov.uk/planning/policy/local_development_framework/evidence_base/annual_monitoring_reports
[67] http://greaterthamesmarshes.com/facing-change/
[68] Defra (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services.

area is favourable recovering which means that if this continues it is possible that by 2020 it will also be in a favourable condition.

Summary of Key Issues Arising from the Baseline Information

- There are 5 European designated sites (the Crouch and Roach Estuaries SPA and Ramsar, Foulness SPA and Ramsar and Essex Estuaries SAC) within the District and these are situated in the estuaries and along the coast in the east and to the north. No information currently available with regard to current condition status for the individual European sites within the District. The condition status for these types of European protected habitats across the UK is poor; however, the overall trend appears to be that the condition status is either stable or improving. The exception to this is Estuary habitats for which the condition status appears to be declining. The population trend for the majority of European bird species at the Crouch and Roach Estuaries appear to be in decline; however, the annual peak counts can fluctuate greatly from year to year. The migration of bird species means that this could be as a result of something happening outside of Rochford District.

- The Habitats Regulations require that planning and management for water resources should ensure that the water supply for development can be supplied sustainably and without adverse effects on European sites – concluded through South Essex Water Cycle Study (2011) as a result of implementation of the Abberton Reservoir Scheme.

- There are 3 SSSIs in the District, located at Hockley Woods, Foulness and the Crouch and Roach Estuaries. The SSSIs are generally in a favourable or unfavourable recovering condition. Overall, the condition of SSSIs within the District has been improving in recent years and this is considered unlikely to change in the future, unless there are any significant changes with regard to the management of the land.

- There are 4 LNRs, 39 LWSs (predominantly woodland but also with significant areas of grassland, mosaic coastal and freshwater habitat types) and 14 Ancient Woodlands within the District. These sites are predominantly located in the west of the District near to Hockley and Rayleigh; however, there are also large sites in the east of the District on the coast. There is limited information on the condition of locally important biodiversity.

- Rochford is one of only 6 districts in Essex with traditional orchards – most are outside protected areas.

- Deficit of natural and semi-natural greenspaces throughout the District except for the Hockley/Hawkwell and Canewdon settlement areas.

- Rochford includes provision of a large area of "green lung" land in the Upper Roach Valley that is acknowledged to be green space for nearby areas in neighbouring councils – need to manage biodiversity and recreational/amenity needs carefully.

Effects of Development

6.39 Housing, employment and infrastructure development has the potential to generate a range of environmental impacts which can, (depending on their nature, magnitude, location and duration), have effects on biodiversity. A summary of the types of impacts and effects that can arise from these types of development is provided in the table below.

Table 6.5: Impact Types and Potential Effects on Biodiversity

Impact Types	Effects on Biodiversity
▪ Direct land take, removal of green/ connecting corridors/ supporting habitat, changes to sediment patterns (rivers and coastal locations) ▪ Introduction of invasive species (predation) ▪ Development could potentially provide new habitats or restore unfavourable ones, helping to improve the connectivity of functional habitat	Habitat & Species fragmentation and loss (for example, coastal squeeze) Provision of habitats or improvements to the connectivity of functional habitats
▪ Increased recreational activity (population increase) ▪ Noise and light pollution (from development and increased traffic) ▪ Development could provide financial contributions towards the management of important biodiversity sites	Disturbance (both physical and non-physical) Improved management at important sites
▪ Increased abstraction levels (new housing) ▪ Increased hard standing non-permeable surfaces/ accelerated run-off ▪ Laying pipes/ cables (surface & ground) ▪ Topography alteration	Changes to hydrological regime/ water levels
▪ Increase in run-off/ pollutants from non-permeable surfaces (roads, built areas) ▪ Increased air pollution (eutrophication) (traffic, housing) ▪ Increased volume of discharges (consented)	Changes to water quality
▪ Increased traffic movements ▪ Increased emissions from buildings	Changes in air quality

6.40 It is important to note that distance of development in itself from a designated site or important habitat or species is not a definitive guide to the likelihood or severity of an impact. Other factors such as inaccessibility/ remoteness, the prevailing wind direction, river flow direction, and ground water flow direction all have a bearing on the relative distance at which an impact can occur. Environmental pathways (and time of travel) are therefore an important consideration alongside the location and scale of development when determining the capacity to accommodate further growth.

Sensitivity and Capacity

6.41 The designated sites and important habitats and species described under this theme are sensitive and therefore vulnerable to a variety of different impacts arising from development, as outlined in Table 6.5 above. Some habitats and species are more sensitive to particular impacts than others; however, this is dependent on a variety of factors which include environmental conditions at the site. As explained above, biodiversity and the ecosystem services it provides can be affected by development from some distance away and over different timescales.

6.42 Biodiversity in the Rochford District was categorised according to five biodiversity areas (see Figure 06c) that reflect particular characteristics and habitat type as follows:

- Biodiversity Area 1: Upper Roach Valley "Green Lung"
- Biodiversity Area 2: Tree Belt
- Biodiversity Area 3: Surrounding Countryside – farmland
- Biodiversity Area 4: Marine and Estuarine – water and wetlands
- Biodiversity Area 5: Urban

6.43 The following tables 6.6a-e summarise each area with its sensitivities, likely impacts and significance, and consideration of capacity.

Table 6.6a: Biodiversity Area 1: Upper Roach Valley "Green Lung" (See Figures 06a-c)		
Summary: An area predominantly containing woodland, with open space and recreational areas, including well-established walking routes. Located in the south west of the District, the area acts as the 'Green Lung' for both Rochford District and Southend-on-Sea Borough. Priority Habitats: Ancient Woodland, Traditional Orchards and Lowland Meadow Biodiversity / Nature Conservation Designations: Hockley Woods (SSSI and LNR), Cherry Orchard Jubilee Country Park, Local Wildlife Sites		
Sensitivity: **Medium – High**	**Likely Impacts & Significance**	**Capacity:** **Medium to low**
The area is recognised as a key 'green lung' serving the Rochford District and Southend-on-Sea Borough, especially for recreational purposes with positive effects for human health and well-being. The area has high potential for protected species, with numerous natural habitats. The SSSI is in recovery moving towards favourable condition status. The area contains ancient woodland, with important cultural heritage values; such woodlands are extremely difficult to replace once lost. The area is largely undeveloped. It is considered that the area is of **medium** susceptibility, and a **high** value.	Potential direct loss of habitats – particularly significant for the ancient woodland as no mitigation possible. Development could contribute to 'enclosing' this space and severing green corridors connecting to the surrounding countryside, although the "green lung" area and associated with the wider green infrastructure (GI) network is protected by planning policy. Development could disturb habitats through noise and light pollution – again protected by policy but cumulative effects could be significant. Potential loss of recreational space that may displace people and/or create increased recreational pressures on other recreational facilities.	The area has the ability to absorb a minor amount of development without affecting the overall character and quality of the biodiversity. However development may result in the loss of recreational land, and therefore increase recreational pressures on the remaining facilities (and see section 7). Development would need to be directed away from the most sensitive areas (i.e. Hockley Woods and Cherry Orchard Jubilee Country Park) to avoid the most significant impacts, and as such is likely to occur around the fringes of this Biodiversity Area. However, this then would have the potential to diminish green corridors to the

	Development could also contribute to decreasing the fragmentation of habitats in the area, through direct and indirect green infrastructure enhancements / provisions.	surrounding countryside and links to the wider GI network.

Table 6.6b: Biodiversity Area 2: Tree Belt (See Figure 06c)		
Summary: An area of land in the rural centre of the District to the east of the urban area of Rochford town/Ashingdon and mostly covered by trees. Priority Habitats: Traditional Orchards Biodiversity / Nature Conservation Designations: Local Wildlife Sites		
Sensitivity: **Medium to low**	**Likely Impacts & Significance**	**Capacity:** **Medium**
Important area of trees contributing to adaptation to climate change, providing shade, wind breaks, and carbon sinks. The traditional orchards hold the genetic resource of old local fruit varieties that have otherwise virtually disappeared – thus valued for its rarity and representativeness. The area is considered to be of **medium to low** susceptibility and of **medium** value. There is scope for positive enhancement.	Development could result in the direct loss of locally important habitats. Development has the potential to increase noise and light disturbance affecting habitats. Potential to enhance biodiversity as part of the wider GI network.	Limited capacity for minor housing development and be directed away from the traditional orchards. Possibilities for environmental enhancement through improving the biodiversity as part of the wider GI network.

Table 6.6c: Biodiversity Area 3: Surrounding Countryside - Farmland (See Figure 06c)		
Summary: This area refers to the countryside stretching across the north of the District (excluding the River Crouch) and stretching south through the centre of the District, surrounding the main settlement areas. Priority Habitats: Floodplain Grazing Marsh, Hedgerows, Arable Field Margins, Traditional Orchards Biodiversity / Nature Conservation Designations: Local Wildlife Sites		
Sensitivity: **Medium to low**	**Likely Impacts & Significance**	**Capacity:** **Medium**
The area adjacent to the River Crouch includes the priority habitat of floodplain grazing marsh that is particularly important for breeding wader and wintering water bird populations. The area also contains boundary hedgerows that are a priority habitat and are likely to be species rich. The area is predominantly agricultural land and mostly used for grazing with some arable thus supporting local food production and providing arable field margin habitats. The central area includes the highest grade of agricultural land quality (see also paragraph 4.8). There are also traditional orchards scattered through the District which provide further habitats and support local food growth. Overall, the area is considered to be of **low** to **medium** susceptibility, and medium value.	Potential loss of, or disturbance to, natural habitats. Development would decrease the amount of available grazing and arable land, limiting opportunities for local food production. However, Core Strategy has recognised need for diversification to support the rural economy. Development has the potential to increase noise and light disturbance affecting habitats.	There is the capacity to absorb small housing development without affecting the overall local biodiversity character and value of the area. Development would need to be directed away from any sensitive biodiversity areas (priority habitats and local wildlife sites).

Table 6.6d: Biodiversity Area 4: East Coast Marine and Estuarine Environment (See Figure 06c)		
Summary: A marine / estuarine environment covering the eastern area of the District, encompassing the coastal islands and rivers Crouch and Roach. Priority Habitats: Coastal Grazing Marsh, Coastal Saltmarsh, Lowland Heathlands Biodiversity / Nature Conservation Designations: Essex Estuaries European Marine Site, Foulness SPA, Crouch and Roach Estuaries SPA, Essex Estuaries SAC, Mid-Essex coast Ramsar sites, Wallasea Island RSPB Protection Area, Foulness SSSI and known protected species of *Osmerus eperlanus*		
Sensitivity: **High**	**Likely Impacts & Significance**	**Capacity:** **None**
The area comprises large European sites protected for their biodiversity values; also key element of the Nature Improvement Area (NIA) The Greater Thames Marshes. The area contains numerous rare and protected habitats, and is known to contain protected species, including *Osmerus eperlanus*. There is the potential for other protected species within this area. Wallasea Island is subject to a managed realignment scheme, and is valued as a habitat for birds. The sites are in relatively poor condition, although most are stable or improving. Habitats are under threat from coastal squeeze, land could therefore be required in the future to	Direct loss of important habitats; noise and light disturbance to natural and protected habitats. Potential effects on long term water and habitat management plans (e.g. space for managed realignment). Development on Wallasea Island could hinder the long-term delivery of managed realignment, bird protection schemes. Development could hinder the recovery of designated sites to achieve a favourable condition status and comply with European requirements. Development has the potential to affect water resources/quality that support	There is no capacity for development in this area due to the significance of potential impacts on biodiversity of European, National and Local importance.

recede the existing defences and supply the necessary area for intertidal habitats. The area is considered to be of **high** susceptibility and **high** value.	biodiversity and rare habitats in the area.	

Table 6.6e: Biodiversity Area 5: Urban Areas (See Figures 06c and 01)		
Summary: Areas containing distinct settlements in built-up urban settings – Rochford & London Southend Airport; Hockley; Rayleigh and Hullbridge; Great Wakering. Priority Habitats: Potentially Ponds Biodiversity / Nature Conservation Designations: Local Wildlife Sites – tend to be adjacent to urban areas and located within the other biodiversity areas identified (1, 2 and 3)		
Sensitivity: **Low**	**Likely Impacts & Significance**	**Capacity:** **High**
There is a development precedent within these areas. Includes less important habitats that are less sensitive to change, existing in a busy environment where change is frequent. It is considered to be of **low** susceptibility and **low** value.	Potential to increase green infrastructure, through infrastructure provisions as a result of development, as well as the creation of new habitats within housing developments (e.g. gardens and ponds).	The area can absorb housing development without affecting the overall biodiversity character or qualities and with scope to improve biodiversity. Development should seek linkages in green infrastructure networks with nearby Local Wildlife Sites to support the creation or enhancement of biodiversity spaces and corridors as part of wider GI network.

7.0 PEOPLE - Health & Well-being (Landscape, Recreation, Cultural Heritage & Historic Environment)

Introduction

7.1 People are the key element affecting and being affected by ecosystems, and we exist only through the services that ecosystems provide, including food, shelter and fuel. People are therefore intrinsically linked to ecosystems, and are an important factor in considering how ecosystems function in part, or as a whole. The main focus for people within ecosystem services lies in cultural services, however it is the activity of people that strongly influence the delivery of other ecosystem services. It is important that the benefits gained from ecosystem services are not to the detriment of provisioning, regulating or supporting services, as people rely on these for a healthy functioning global ecosystem to support life on earth.

7.2 As illustrated previously in Diagram 1.1, there are fundamental dynamic interactions between ecosystems and human health and well-being. These recognise that health is more than just freedom from disease – "*Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1948).* Ecosystems services that are supporting, provisioning and regulating for human health have been considered within this study as part of the themes on air, land, water and biodiversity (sections 3-6). However, cultural ecosystems services are also important to sustain human health and well-being, for example, aesthetic, spiritual, educational and recreational services – also known as the Quality of Life.

7.3 A summary of the ecosystem services that are provided by the scope of human needs is shown in the table following:

Table 7.1: Ecosystem services for Human Health & Well-Being[69]

Provisioning Services *The products obtained from ecosystems.*	**Regulating Services** *The benefits obtained from the regulation of ecosystem processes.*	**Cultural services** *The non-material benefits people obtain from ecosystems.*
▪ Food e.g. crops, fruit, animals and fish ▪ Mineral deposits ▪ Fibre and fuel e.g. timber, wool; materials for security and health e.g. heating and housing ▪ Biochemicals, natural medicines and pharmaceuticals	▪ Air quality essential for human health ▪ Climate regulation (avoidance of climate stress, temperature regulation), essential for human health ▪ Water regulation, essential for human health and survival ▪ Pollination supporting human health and wellbeing	▪ Aesthetic values ▪ Recreation & Tourism ▪ Social values ▪ Health & Well-being ▪ Spiritual or Religious values ▪ Inspiration (e.g. for art, folklore, architecture) ▪ Cultural Heritage values

[69] Defra (2013) An introductory guide to valuing ecosystem services [online] [accessed October 2014]

Supporting Services *Ecosystem services that are necessary for the production of all other ecosystem services.*		
▪ Weathering (soil production) ▪ Provision of habitats ▪ Nutrient cycling ▪ Primary production ▪ Water cycling ▪ Production of atmospheric oxygen		

7.4 Cultural ecosystem services that contribute to human health and well-being and are within the scope of spatial and environmental planning may be categorised as follows:

- Landscape and Visual Amenity – countryside including land and seascapes and urban townscapes, including design of buildings and their settings
- Recreation – access to both formal and informal facilities
- Cultural Heritage – the historic environment including buildings, features and their settings, and archaeology

7.5 The value and importance of these cultural resources can be subjective and may vary according to type or character, location and rarity. The capacity of these ecosystems services to accommodate change through proposed additional housing can be difficult to evaluate. However, there are standard methods for assessing likely effects and capacities, for example, on Landscape & Seascape Character Assessments, 2014[70] and Landscape & Visual Impact Assessment, 2013[71], and these have been used where relevant.

7.6 Policy and baseline conditions for landscape, recreation and cultural heritage are considered separately in the following subsections. However, as these topics are so inter-related and include investigation of Quality of Life factors, the sensitivity and capacity evaluations are considered all together and according to the spatial categories of landscape character areas within the Rochford District (see Table 7.2 and Figures 07 Landscape & Visual Amenity; 08 Recreation & Amenity; and 09 Cultural Heritage).

Landscapes, Townscapes and Seascapes

Introduction

7.7 Landscapes are defined under the European Landscape Convention[72] (ELC) as '*an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors*'. Further definitions of landscape from Natural England include:

[70] https://www.gov.uk/landscape-and-seascape-character-assessments
[71] http://www.landscapeinstitute.co.uk/knowledge/GLVIA.php
[72] EC (2000) European Landscape Convention in Florence

- a complex interaction of natural, cultural, perceptual and aesthetic factors
- dynamic and always evolving
- representing multiple values - tangible and intangible
- existing at any scale

7.8 Landscapes provide a number of ecosystem services including:

- **regulating services:** climate regulation and erosion control
- **cultural services**: aesthetic values, recreation and amenity, inspiration, social values, spiritual or religious values and cultural heritage values; and
- **supporting services**: weathering and habitat provision

7.9 Landscape applies to natural, rural and urban areas, including land, inland water, intertidal and marine areas. As such, and for the purposes of this study, landscape encompasses the countryside, townscapes and seascapes. Landscape qualities that provide visual amenity for human well-being are considered within this section; other amenity services, such as arising from recreational factors, are considered within the following section on recreation. Historical landscapes and the settings (including visual appreciation) of historic buildings and features are also important attributes of ecosystems affecting human well-being. These matters are considered where most significant – in this landscape section and/or within the cultural heritage and historic environment section following.

7.10 Landscapes are intrinsically linked to the other themes being considered through this Environmental Capacity Study and the services they provide. Good air, soil and water quality and biodiversity are all important factors in maintaining the character and integrity of landscapes. Changes to any of these themes can influence the supply of ecosystem services and benefits they provide.

Policy Context

7.11 The NPPF requires good quality design of the built environment and this includes guiding planning policies with regard to the "…massing, height, landscape, layout, materials and access of new development in relation to neighbouring buildings and the local area more generally." (Paragraph 59). The fundamental aim of Green Belt planning policy is to prevent urban sprawl by keeping land permanently open. Once Green Belt is defined, LPAs should plan positively including retaining and enhancing landscape and visual amenity (paragraph 81).

7.12 Planning policies should maximise renewable and low carbon energy while ensuring that adverse impacts are addressed including cumulative landscape and visual impacts (paragraph 97). Local Plans should take account of climate change over the longer term including factors such as landscape (paragraph 99). The planning system should contribute to and

enhance the natural and local environment by protecting and enhancing "valued landscapes" (paragraph 109), including maintaining the character of the coast with its distinctive landscapes (paragraph 114) and giving great weight to conserving landscape in National Parks, and the AONBs (paragraph 115).

7.13 The overall vision set out in the adopted Rochford Core Strategy[73] seeks to protect and enhance the District's character and role as the green part of the Thames Gateway South Essex sub-region. Policy ENV1 seeks to protect the natural landscape; Policy WNV2 protects and enhances the landscape of the coastal area; and ENV6 directs large-scale energy projects away from areas of landscape value. Policy URV1 requires that access through the Upper Roach Valley and any essential development will be designed to have minimum impact on the landscape. The Allocations Plan (2014) sets out the important local areas for landscape with ELA2 defining the protection for the Coastal Protection Belt and Policy ELA3 defining the Upper Roach Valley which protects the important landscape characteristics between the towns of Rayleigh, Hockley, Rochford and Southend.

7.14 The collaborative work on greenspaces and green infrastructure as a key element of ecosystems services includes the Thames Gateway Parklands[74] programme as a collaboration between 3 local green networks: the East London Green Grid, South Essex Green Grid, and Greening the Gateway Kent & Medway. A key part of the Thames Gateway Vision, this aims to create a high quality and high value parklands landscape to support sustainable growth. Green Infrastructure includes high quality natural and semi-natural areas with other environmental features (and see previously paragraph 6.10 Biodiversity).

Current Situation

7.15 The District includes two Landscape Character Areas defined at the national level: the Greater Thames Estuary and the Northern Thames Basin - characterised as follows:

The Greater Thames Estuary[75]:

- Predominantly flat, low-lying coastal landscape where extensive open spaces are dominated by the sky, and the pervasive presence of water and numerous coastal estuaries extending the maritime influence far inland
- Important sites for geodiversity
- Open grazing pastures patterned by a network of ancient and modern reed-fringed drainage ditches and dykes, numerous creeks and few hedges, fences or trees
- Traditional unimproved wet pasture grazed with sheep and cattle combined with extensive drained and ploughed arable land protected from floods by sea walls

[73] Rochford District Council Core Strategy adopted 13 December 2011). Available online: http://www.rochford.gov.uk/planning/policy/local_development_framework/core_strategy_dpd1

[74] http://segip.org/sub_regional_network/

[75] National Character Area Profile 81: Greater Thames Estuary [online]

- Strong feelings of remoteness and wilderness on extensive salt marshes, mudflats and reclaimed farmed marshland
- Visibility of development and the built environment from low-lying marshes

The Northern Thames Basin[76]:

- A wide plateau divided by river valleys
- A layer of thick clay producing heavy, acidic soils, resulting in retention of considerable areas of ancient woodland
- Areas of nutrient-poor free-draining soils supporting remnant lowland heathlands. In the Essex heathlands 18th and 19th century enclosure of heathlands and commons followed by extensive 20th century field enlargement is dominant
- Rich archaeology
- A medieval pattern of small villages and dispersed farming settlement remains central to the character of Hertfordshire and Essex.

7.16 The East of England Intrusion Map[77] illustrates how the east of the District is largely formed of undisturbed and tranquil areas, whilst the mostly built-up western parts of the District includes many areas disturbed by noise and visual intrusion, particularly to the south west around Rayleigh and boundaries with Castle Point and Southend Borough areas.

7.17 The landscape character[78] of the District is comprised of three types (see Figure 07):

- Crouch and Roach Farmland
- Dengie and Foulness Coast
- South Essex Coastal Towns

7.18 The latter of these three is identified as the least sensitive to development. The Rochford Core Strategy shows that there is a clear east-west divide in the character of the District, with a significant proportion of the District's protected landscapes focused in the east towards the coast. The east of the District is relatively inaccessible and sparsely populated, for example, the marsh sands of Foulness Island are owned by the Ministry of Defence with restricted access. The District's population is predominantly situated in the west, and there are large areas of open space in close proximity to the District's main settlements. The Core Strategy seeks to protect and enhance these open spaces, referred to as the Upper Roach Valley (see Figure 07), recognising that they form the 'green lung' of the District.

7.19 Much of the landscape is designated as Green Belt land (see Figure 03 Planning Context), and the rural settlements within this have little or no services and residents are often completely dependent on the private car to

[76] National Character Area Profile 111: Northern Thames Basin [online]
[77] CPRE (2007) East of England Intrusion Map [online] http://www.cpre.org.uk/resources/countryside/tranquil-places/item/1784?highlight=WyJpbnRydXNpb24iLCJtYXBzIiwiaW50cnVzaW9uIG1hcHMiXQ [accessed October 2014]
[78] Rochford District Council Core Strategy (adopted 13 December 2011).

access facilities. The Strategy seeks to retain this openness, and a rural setting, whilst enhancing green tourism and rural diversification opportunities. The openness and sensitivity of the undeveloped landscape was recognised over 30 years ago with the development of planning policy to protect the landscape from development (The Coastal Protection Belt).

7.19 The extant Landscape Character Assessments (LCAs) conducted in 2005[79] for the Essex Coast and in 2003[80] for Essex and Southend-on-Sea provide good insight into baseline conditions. The 2003 LCA describes Essex as a county of low hills and undulating valleys, with extensive areas of low flat land near to the coast. Within the District, the LCA notes the large number of rivers (see Figure 06a) (largely as a consequence of the proportion of clay soils) that are an important component of the topography, character and identity. These river corridors are highlighted for landscape, nature conservation, heritage and recreational values. The coastline is mainly marshland featuring short stretches of cliff, shingle spits, and shellbanks. The LCA reports that farming and agriculture is a major land use within Essex, with considerable influence on the landscape character and natural habitats. The key characteristics, trends and sensitivities in each Landscape Character Area may be summarised as below:

7.20 ***Crouch & Roach Farmland:*** Stretching across the north of the District and extending south through the centre of the District (see Figure 07). The coastal character of the area is defined by the narrow estuaries that penetrate far inland, with associated mudflats, saltmarsh and reclaimed marshlands. Moderate to steep side estuary valley sides are a distinctive backdrop either side of the Crouch. Typically, thick hedgerows dominated by scrub elm follow the rectilinear field boundaries. Significant loss of hedgerows in the south of the landscape area has resulted in a fairly open character here. The settlement pattern is sparse along the edge of estuaries, tending towards the slightly higher and drier land. Large parts of the area have a tranquil character in a rural setting.

7.21 The key characteristics are summarised below:

- Long narrow Crouch and Roach river estuaries with bands of flat low lying marshlands
- Rolling or gently undulating arable farmland between the estuaries. Regular fields of variable size and thick or intermittent hedgerow boundaries
- Frequent long views across the farmland to the estuaries from higher ground
- Strongly right angled pattern of lanes
- Small villages, a scattering of hamlets, farmsteads, and newer suburban properties are concentrated along the lanes on higher ground.

[79] http://www.rochford.gov.uk/sites/rochford.gov.uk/files/documents/files/planning_character_JAAP12.pdf
[80] http://www.essex.gov.uk/AnalyticsReports/CB_LCA_Essex_2002.pdf

7.22 The 2003 LCA indicates that the condition of small settlements is mixed, with some out of character modern infill. Many hedgerows are also fragmented. Since the Second World War there has been a significant loss of grazing marsh as a result of agricultural intensification, and a loss of Elm trees during the 1960s / 70s has made the character of the area more open. There exists an ongoing trend for urban development and transportation development, as well as demand for additional boat moorings and marina facilities along the estuaries, together with requirements for maintaining existing flood protection.

7.23 ***Dengie and Foulness Coast:*** Comprises the islands in the east of the District (see Figure 07). A distinctive extensive area of reclaimed marshlands, and of sweeping tidal mud flats and sands beyond the sea wall. As an exposed landscape it is dominated by the sky and / or the sea. Settlement in the area is sparse, and there are very few trees. No major roads cross the area, increasing its remote tranquil character.

7.24 The key characteristics are summarised below:

- Large scale, flat landscape
- Sense of openness / space with wide views
- Vast tidal mudflats and sands, and extensive fringing saltmarshes, rich in wildlife
- Mainly arable farmland of the reclaimed marshlands, intersected by ditches and dykes
- Absence of woodland, only a few hedgerows
- Isolated farms and barns, with small villages restricted to the fringes
- Bradwell Nuclear Power Station is a significant landmark (north of the Rochford District Area, in the Maldon District Area)
- Military presence
- Remote tranquil character
- Limited accessibility

7.25 The 2003 LCA reports that since the Second World War there has been a significant loss of coastal grazing marsh and of features such as decoy ponds and old sea wall, as a result of agricultural intensification. It is indicated that the main future influences on changes are likely to be agricultural and flood protection.

7.26 ***South Essex Coastal Towns:*** Comprises most of the settlement areas in the south of the District, extending north in the west of the District to include Rochford and Hockley (see Figure 07). This is an area of mixed character in a largely urban setting. Around Hockley the urban form is softened by large woodlands and the Roach Valley is largely undeveloped. The key characteristics are summarised below:

- Large areas of dense urban development
- Large blocks of woodland
- Particularly complex network of major transportation routes
- Pylon routes visually dominating farmland in the A130 corridor

- Landscape features include: Rayleigh Castle, Pylons and overhead lines, and Southend Airport

7.27 The 2003 LCA indicates that the condition of the settlements is very mixed, with poor quality development common, and the quality of the woodlands and hedgerows is moderate. The area has been subject to significant change in the 20th century including large urban expansions. Urban development is likely to be a significant ongoing trend. The Upper Roach Valley in the study area is the key area that will be sensitive to change; recreational pressures are likely to be considerable as it contains Hockley Woods and Cherry Orchard Jubilee Country Park, the recreational values of which are described in the following recreation section.

Recreation & Amenity

Introduction

7.28 Recreational activities outdoors, such as walking, running, cycling, sailing and swimming offer opportunities for people to experience the benefits of ecosystems directly. This may apply particularly to people living in urban environments where contact with natural or semi-natural environments is often limited. Every day and (often) short-term outdoor recreation in nearby green or open spaces in urban areas is also very important with positive effects for human health and well-being. These activities are tangible and can be measured quantitatively.

7.29 Landscape and other aesthetic factors, such as cultural and historic heritage frequently contribute to recreational experiences and are often associated with the identities of people and communities reflecting the complex inter-relationships between ecosystems and human societies. These amenity factors can provide pleasure through spiritual and intellectual stimulation, fulfilment, and creative inspiration that contribute to physical and psychological health and well-being. Such attributes are less tangible and may only be subject to qualitative measurements.

Policy Context

7.30 The NPPF promotes mixed use developments, encouraging multiple benefits from the use of land and recognising that some open land can have various functions including recreation (core principles). The planning system should deliver social, recreational and cultural facilities and services according to community needs (paragraph 70), recognising the importance of recreation to health and well-being (paragraph 73). LPAs should plan positively to enhance the use of the Green Belt including for outdoor sport and recreation (paragraph 81). Planning should aim to identify and protect areas of tranquillity and are prized for their recreational and amenity value (paragraph 123).

7.31 The Rochford Core Strategy (paragraph 2.56) sets the context with the Thames Gateway as a national priority for regeneration and new housing in the South East of England. The vision for Thames Gateway South Essex is

focussed on the creation of sustainable communities that make the most of the unique characteristics of South Essex. Rochford District is recognised as an area for developing leisure, recreation and tourism activities and in particular is key to the development and expansion of the Green Grid – the connection of residential areas with green spaces.

7.32 Policy GB1 will ensure that only the minimum amount of Green Belt will be allocated as necessary to meet the District's housing and employment needs. Outdoor recreational, leisure and green tourism activities are also supported to enhance the local rural economy whilst protecting the character and openness of the Green Belt (Policy GB2). Policy URV1 seeks to support the Upper Roach Valley becoming a green lung providing informal recreational opportunities with access managed for minimal adverse impacts on landscape and wildlife. Policy URV2 supports the RSPB and the Wallasea Island Project, promoting recreational use that will not cause adverse ecological impacts. Policy CLT4 Healthcare requires new development to incorporate accessible public open space, including providing for recreation.

7.33 The Allocations Plan (2014) provides policies to protect locally important green spaces, for example, Policy ELA1 lists 39 sites for Local Wildlife Sites designation, mostly woodland and as shown in Figure 04b. Policy ELA2 protects the Coastal Belt and Policy ELA3 allocates the Upper Roach Valley area protecting this from development that would undermine its role as a green space providing informal recreation opportunities.

The Current Situation

7.33 The District provides a range of leisure facilities that shape the environment and the way that people interact with it, including sports pitches, skate parks, golf courses, marinas, activity centres and school facilities which can often also be open to the public during the holiday period. Significant buildings include The Mill Arts and Events Centre (Rayleigh), Clements Hall Leisure Centre (Hawkwell), Great Wakering Leisure Centre (Great Wakering), and The Freight House (Rochford).

7.34 Large areas of open space located near to main settlements provide the potential for recreational opportunities, particularly if such spaces are linked to residential development. Areas of landscape & ecological importance, especially the Upper Roach Valley & Hockley Woods, have the potential to provide high quality open space accessible to people. The Open Space Study[81] for Rochford investigated open spaces for their quality, quantity, and accessibility in order to inform the preparation of the Core Strategy. This included consideration of need through a wide public consultation. Open Spaces were categorised as follows:

- Natural & Semi-Natural Greenspaces
- Amenity Greenspaces
- Country Park
- Allotments

[81] http://fs-drupal-rochford.s3.amazonaws.com/pdf/planning_evibase_openspacestudy.pdf

- Provision for Children & Young People
- Outdoor Sports Facilities
- Cemeteries & Churchyards
- Streets, Squares & Pedestrian Areas (including market squares & other hard surfaced areas for civic, public & community events)

The need, quantity, quality and accessibility of these open spaces were investigated according to 6 settlement areas: Canewdon; Great Wakering/Barling/Foulness; Hockley/Hawkwell; Hullbridge; Rayleigh/Rawreth; Rochford/Ashingdon.

7.35 Recreation and open spaces within the District include:

- Over 30 football pitches
- 27 play spaces for children
- Sweyne Park, Rayleigh – offering children's play space, a wildlife area with environmental ponds and 2km bridle path over 57 acres
- Hockley Woods – ancient semi-natural woodland designated as a Site of Special Scientific Interest (SSSI) and Local Nature Reserve (LNR) attracting over 40,000 visitors each year over an area of almost 300 acres, offering parking, toilets, picnic area, play space, marked trails and a permissive horse route
- Cherry Orchard Jubilee Country Park, south of Hawkwell – a 100 acre country park with woodlands, a lake, bridleways, flower meadows and way marked walks.
- The Rayleigh Windmill Museum and heritage resource centre
- Cinemas and community centres generally within settlements
- 3 golf courses - Ballards Gore, Rochford Hundred and The Rayleigh Club
- Marinas include the Essex Marina on Wallasea Island and Sutton Wharf just south east of Rochford town centre

7.36 Generally, there is an uneven distribution of open spaces across the District with most natural and semi-natural greenspaces focused around the Hockley/Hawkwell settlement area. The southern parts of the District are within the Thames Gateway South Essex Partnership Green Grid Strategy (draft 2005)[82] area. Studies for the Green Grid informed the Rochford Core Strategy with its commitments to creating and enhancing green linkages including 6 proposed Greenways to link the southern part of the District with the neighbouring authorities of Castle Point and Southend-on-Sea.

7.37 The collaborative work on greenspaces continues with the South East Green Infrastructure Partnership (instigated in 2011)[83]. The Thames Gateway Parklands programme (and see previously paragraphs 6.10 Biodiversity and 7.14 Landscape) is a collaboration between 3 local green networks: the East London Green Grid, South Essex Green Grid, and Greening the Gateway Kent & Medway. The Green Infrastructure (GI) promoted through these 3 Green

[82] http://fs-drupal-rochford.s3.amazonaws.com/pdf/green_grid_strategy.pdf
[83] http://segip.org/sub_regional_network/

Grids recognises that areas are valued for their character, biodiversity and role in sustaining ecosystems and helping to adapt and mitigate for climate change. This includes opportunities that GI affords for public access and recreation (Natural England)[84].

Historic Environment & Cultural Heritage

Introduction

7.38 The historic environment comprises heritage and archaeological assets, features and their settings, and the contributions they make to the character of places. Cultural heritage usually refers to the legacy of biophysical features, physical assets and features, and intangible attributes of people and communities, such as myths, legends and spiritual practices that refer to certain places and ecosystem features. Although some historical and cultural values may have little dependence on ecosystems, for example, those directly associated with historic buildings, changes to surrounding landscape and settings will affect the experience.

Policy Context

7.39 The NPPF requires a positive approach for the conservation and enjoyment of the historic environment, including recognition that heritage assets are an irreplaceable resource that should be conserved in a manner appropriate to their significance (paragraph 126). Where appropriate, landscape character assessments should be prepared and integrated with assessment of historic landscape character (paragraph 169). A heritage asset is defined as a building, monument, site, place, area or landscape having significance because of its heritage interest. It should be noted that Historic England has produced a good practice advice note on implementing the historic environment policy in the NPPF[85].

The Current Situation

7.40 In the Rochford District area, the historic environmental resource is recognised as rich, complex and irreplaceable. Some of the resource lies beneath the ground as archaeological deposits; the historic landscape demonstrates thousands of years of human activity through agriculture and commerce; and the built environment is rich with towns, villages and hamlets. The historic environment lends character to places and can play a key role in creating and enhancing communities.

7.41 The heritage resource includes nationally designated assets as shown on Figure 09:

[84] http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0CDMQFjAD&url=http%3A%2F%2Fpublications.naturalengland.org.uk%2Ffile%2F94026&ei=uabUVPyKM6OE7gbwzYDQDw&usg=AFQjCNFRLUYhV9YEcX4a5f7RvQe6DXAf9w&bvm=bv.85464276,d.d2s

[85] Historic England (March 2015) The Historic Environment in Local Plans. Available online: http://historicengland.org.uk/images-books/publications/gpa1-historic-environment-local-plans/

- 10 Conservation Areas (areas of special architectural or historic interest), including areas at Great Wakering, Rayleigh and Rochford, and Battlesbridge (joint with Chelmsford BC)
- 6 Scheduled Monuments, including Rayleigh Castle and Rochford Hall
- Many Listed Buildings - One Grade 1(Rochford Hall) and 17 Grade II* scattered through both the urban and rural areas and throughout the whole District area

And more than 350 sites of archaeological interest are recorded on the Heritage Conservation Record (HCR) in the Rochford District. These range from Palaeolithic flint axes through a variety of prehistoric, Roman, Saxon and medieval settlements to post-medieval and modern industrial sites, and World War II and Cold War monuments. These represent only a small fraction of the archaeological resource with probably many sites undiscovered and unrecorded[86].

7.42 In recognition of the role of the historic environment as an integrated part of spatial and development management planning, The Rochford Historic Environment Characterisation Project[87] investigated the historic urban, historic landscape and archaeological character to inform development decision-making. The project explored the diversity, character and sensitivity of the historic environment working with the 14 Historic Environment Character Areas (HECAs) that had been defined across the District. The assessment built on earlier work and divided the HECAs into 40 more specific and more detailed Historic Environment Character Zones (HECZs) to better inform spatial planning. This also included consideration of 10 Archaeological Character Areas (ACAs). The character and current baseline conditions of the 14 HECAs are summarised as follows (paragraphs 7.41-7.55):

7.43 ***HECA 1: Wallasea Island:*** A large area of reclaimed land between the River Crouch and the River Roach. Most of the island is agricultural land, together with reed beds, saltings, and the Essex Yacht Marina. The island has been extensively changed due to modern drainage practices, and agricultural improvements in the middle of the 20th century are likely to have destroyed most archaeological deposits. There is a perimeter sea wall beyond which, within the intertidal zone, is the area most likely to still contain any archaeological deposits.

7.44 ***HECA 2: The estuary marshes of the Roach and Crouch:*** These estuary marshes are historic marshes drained by dykes and protected from flooding by a perimeter sea wall and 'counter' walls. Hedge-less and treeless, it is a flat land of rich fertile alluvial clay and silts containing a variety of archaeological remains, with very few buildings. Surviving earthworks include former sea walls and aerial photography has identified the course of post-medieval relict sea walls.

7.45 ***HECA 3: Foulness Island:*** Part of an open estuarine system comprising grazing marsh, saltmarsh, inter-tidal mudflats, cockleshell banks, sand-flats and arable. An historic settlement, field patterns, relict earthworks and

[86] http://www.rochford.gov.uk/planning/environment/ancient_monuments
[87] http://fs-drupal-rochford.s3.amazonaws.com/pdf/planning_historic_environment_project.pdf

archaeological deposits survive on the island. Although there are two nucleated villages (Church End and Courtsend) the area contains mostly dispersed farmsteads and moated sites. A number of farmhouses date to late medieval and early post-medieval periods, and there are also surviving roads and tracks, including the 'Broomway' in the intertidal area. Historic features also include preserved boundaries of individual marshes, relict sea walls and dykes. The village of Church End is largely designated as a Conservation Area with a loose arrangement of cottages within a rural setting with long standing military operations associations.

7.46 ***HECA 4: Potton and Rushley Islands and adjacent marshlands:*** In a rural setting these islands are dominated by agriculture and former grazing marshes. It is a flat landscape with very few buildings, and expansive views, particularly to the east. The area has a high archaeological potential and identified archaeology has included significant Palaeolithic deposits.

7.47 ***HECA 5: Central Rochford District:*** In a rural setting, this area is dominated by prairie fields in the south with dispersed and more recent linear roadside settlement, and an undulating landscape with more nucleated villages and a strong historic grid structure in the north, often with roads again becoming the focus for settlement. A mix of prehistoric and early medieval archaeology has been identified in the area, and overall the archaeological potential of the area is considered to be high where extraction has not already taken place. The area contains 5 designated Conservation Areas; two in Canewdon (Canewdon Church and Canewdon High Street), one in Great Wakering and two in Paglesham (Paglesham Church and Paglesham Eastend).

7.48 ***HECA 6: Shopland:*** This area is predominantly recreational and rural comprising of a golf course, scattered farmsteads, some linear roadside development and agricultural fields. With such low levels of development the area has had little archaeological investigation. The area has a strong urban fringe character around the boundary of Southend-on-Sea, and is sited at one end of a distinctive east-west raised ridge. The area contains Shopland Churchyard Conservation Area, an isolated rural churchyard fully enclosed by a thick boundary of mature trees and scrub in marked contrast to the surrounding open landscape.

7.49 ***HECA 7: Rochford and Ashingdon:*** The area covers the settlement of Rochford and is comprised of modern expansion areas and a small historic core. The historic core of the market town of Rochford has an intact street layout and pattern with a number of Listed Buildings and a Conservation Area. The small core of the historic settlement of Ashingdon lies on the northern border and is also surrounded by modern housing. The area has been subject to densification since World War II through piecemeal plot-land type development. The area has acted as a focus for settlement for millennia, and outside areas of intensive development it is highly likely that archaeological deposits may be encountered.

7.50 ***HECA 8: Upper Roach Valley:*** The area has an open fieldscape pattern of modern fields interspersed with significant tracts of ancient woodland and occasional older fields. It is an area of rolling hills and valleys containing little

settlement and few roads. Parts of the area have been developed, for example, Southend Airport and golf courses in the south east, but for most part the area retains a strong rural character. The area also contains a number of known archaeological sites from a range of periods, in particular along the western edge.

7.51 ***HECA 9: Land between Ashingdon and Hockley:*** This is an area of rolling topography, a mixed patchwork rural setting, interspersed with ancient woodland and secondary woodland. It is a well-settled area and is influenced by the neighbouring urban areas. Development in the area is likely to have damaged deposits, and stable land patterns in the undeveloped areas have resulted in a lack of archaeological investigation, however the area is considered of high potential for more finds especially around the Early Saxon settlement of Ashingdon.

7.52 ***HECA 10: Hockley:*** The area is broadly modern development encompassing the settlement of Hockley. Some elements of its historic core survive, including a number of buildings and the original road layout, however much of the area has been redeveloped. North of the historic core is a small area of modern industrial development and pre-WWII housing development began a process of expansion and densification in the rest of the suburban area. Despite development that is likely to have damaged deposits and a lack of archaeological investigation in the area, there are regular find spots of roman, prehistoric and early medieval material, indicating a long period of occupation.

7.53 ***HECA 11: Area around Hullbridge:*** An area of rolling topography containing a mixed historic landscape character that includes an extensive swathe of plot-land type development surrounded by a golf course and a mix of field types. The area contains modern housing development and more scattered housing interspersed with woodland. The area has had little archaeological investigation.

7.54 ***HECA 12: Upper Crouch Estuary:*** This small area comprises part of a series of gently undulating valley sides around the rural limit of the Crouch estuary. Settlement is largely confined within Battlesbridge, which is surrounded by prairie fields resulting from boundary losses. There is also a small number of scattered farmsteads. The area has had little archaeological investigation. Battlesbridge contains a Conservation Area, distinctive by its close river connections, mill buildings and Victorian bridge.

7.55 ***HECA 13: Rawreth:*** The area comprises a large expanse of low-density residential development situated within a network of fields, common and woodland / scrub. The area has had little archaeological investigation.

7.56 ***HECA 14: Rayleigh:*** The area encompasses the historic town of Rayleigh with its medieval historic core including the castle and the High Street which, although a designated Conservation Area, has been subject to modern redevelopment and infill, including expansion zones and modern industrial estates. The area forms a distinctive raised ridge running east-west and north-south overlooking the clay plain and the Thames. Archaeological sites from a

range of periods have been identified in the area and there is high potential of encountering further deposits.

People - Health & Well-being (Landscape, Recreation, Cultural Heritage)
Summary of Key Issues Arising from Baseline Information:

7.57

- An evident east-west divide; 4 Landscape Character Areas defined
- Extensive flatlands, with far reaching views; dominance of the sky and/or sea in exposed landscapes - to east and north
- Intrusive infrastructure, for example, pylons clearly visible across the landscape
- Airport presence acting as a node for activity in the south of the District
- Concentration of urban development within, and sparse settlement patterns with low accessibility and tranquillity outside of, the South Essex Coastal Towns Landscape Character Area (LCA)
- Historic Landscapes & 10 Conservation Areas; many Listed Buildings throughout the District & rich historic environment
- 44 detailed zones and 10 archaeological character areas identified in 14 Historic Environment Character Areas (HECAs)
- Key Green Infrastructure in the Upper Roach valley, including dedicated bridleways, children's play space, ancient woodland and marked walking routes
- Prominence of water, rivers and estuaries across the study area
- Agricultural activities across large areas of the District – to north, east and south-east
- Opportunities for enhancing green tourism and rural diversification
- Coastline protection, including significant habitats and species
- Coastal erosion threats and a likely increased need for increased flood protection measures as result of climate change
- Demand for marina facilities and mooring space along estuaries
- Fragmented hedgerows across the Crouch & Roach Farmland Landscape Character Area
- Green Belt designation effectively across the whole Rochford District area

Effects of Development

7.58 Housing and the associated infrastructure development has the potential to generate a range of environmental impacts which can (depending on their nature, magnitude, location and duration) have effects on landscapes, recreation and the historic environment. A summary of the types of impacts and effects that can arise from development is provided in the table following:

Table 7.2: Impact Types and Potential Effects on Landscapes, Recreation & Amenity, and the Historic Environment

Impact Types	Effects on Landscapes, Recreation & Amenity, and the Historic Environment
▪ Direct land take ▪ Loss of Green Belt land ▪ Development can also provide accessible open and green spaces for recreation	Loss of openness – decrease in aesthetic, recreational, inspirational and social values; Coalescence Changes to the characteristics of a rural setting Loss of recreational & amenity land Loss of historic assets, their significance and settings; & archaeological potential
▪ Visibility of new housing and associated infrastructure ▪ Interruptions to skyline &/or dominance of sky	Loss of far reaching views – decrease in aesthetic, recreational, inspirational and social values Disturbance to settings that may harm the significance of heritage assets.
▪ Increased use of recreation, amenity & historic assets ▪ In some situations development can help to improve access and signage to designated heritage assets or perhaps bring them back into use.	Potential loss of openness & tranquillity Disturbance to use & appreciation of recreational & historic assets Improved access to designate heritage assets
▪ Noise and light disturbance	Loss of tranquillity Disturbance to use & appreciation of recreational & historic assets

Sensitivity, Significance and Capacity

7.59 Although it is recognised that Green Belt is a planning tool, rather than an environmental resource *per se*, Green Belt designation is focused on protecting open space and through consideration of landscape character and sensitivity. Therefore it is included as an issue affecting the condition of the receiving environment.

7.60 Four Landscape Character Areas (LCAs) [Crouch & Roach Farmland; Dengie & Foulness Coast; South Essex Coastal Towns; and the Upper Roach Valley] are defined for the Rochford District area and each has a different sensitivity to change, different vulnerability to different impacts from development, and thus the potential for accommodating new housing development. The historic environment studies based their investigation and analysis on these 4 LCAs. Each Historic Environment Zone was assessed with regard to sensitivity to medium-large scale housing development and amenity value using a significance scale of 1-3. Whilst this Environmental Capacity Study considers the possibilities for accommodating small scale housing, these findings are still valid and have been integrated into the overall capacity.

7.61 The Open Space Study based its investigations on 6 settlement areas and these may be generally aligned with the LCAs. Therefore, and as they are so

inter-related, sensitivities and capacity to accommodate change with regard to landscape, recreation, amenity, and the historic environment are considered according to the 4 categories of landscape character – as explored in the tables 7.3(a-d) following:

Table 7.3a: Crouch & Roach Farmland
(See Figure 07)

Landscape Character Area Summary: Narrow estuaries penetrating far inland with associated mudflats, saltmarsh and reclaimed marshlands. Sparse settlement pattern and tranquil character with expansive views
Includes **Living Landscapes Biodiversity Networks**: 45 Crouch & Roach Estuary; 50 Thames Medway Gravels South

Comprises **Historic Environment Character Areas (HECZs):** 2, 5, 6, 7 (a minor part), 10, 11, 12, 13, 28, 32, 35, 36, 37 40
Archaeological Character Areas: 1, 2, 6 & 7
Includes **Conservation Areas:** Battlesbridge, Canewdon Church, Canewdon High Street, Great Wakering, Paglesham Church, Paglesham Eastend, and Shopland Churchyard.
Includes **Scheduled Monuments:** Plumberow Mount & Heavy Anti-aircraft gunsite, 380m south east of Butler's Gate.
Includes a number of **Listed Buildings.**

Includes **key recreational areas:** Ballards Gore Golf Club; tranquil and rural informal recreation (walking, bird-watching) around estuary marshlands with strong network of footpaths
Open Space Settlement Areas: Canewdon (western two-thirds); Great Wakering/Barling; Hullbridge; Rawreth

Sensitivity: Medium	**Likely Impacts & Thresholds of Significance**	**Capacity: low in the north & east; Medium in west & south-east**
This area covers much of the northern and central parts of the District. The north and east are bounded by river estuaries with visual exposure of some estuary valley sides. Overall, this is an open and tranquil character, with sparse settlement in a rural setting. There are 7 Conservation Areas, indicating significant cultural and conservation values as well as two Scheduled Monuments and a number of Listed Buildings.	Adverse impacts on the visual exposure of the landscape – especially in the north adjacent to the Crouch Estuary and the east adjacent to the Roach Estuary with marsh and wetlands. Potential for adverse impacts on sensitive historic marshland areas, Conservation Areas and listed buildings. There is also the potential for adverse impacts on the two scheduled monuments if development is located to the north	Development in the west of the area is likely to have the least impacts on landscape as it connects to existing development and infrastructure, and is an area where there is less likely to be prominent views. Development in the north and the east of the area is likely to alter visual exposure and therefore the landscape character. Development in the south east of the area may alter visual exposure to some extent. However there is the potential to limit this by directing development towards the existing settlements such as Great Wakering, enhancing connections with Southend-on-Sea.

HECZs: 9, 13, 14, 15, 28, 32, 35, 36, 37, 40 (in part) - medium sensitivity HECZs: 10 Estuary Marshes, 11 Paglesham, 12 Canewdon, 41 Crouch marshland - highly sensitive Recreational facilities are in keeping with the rural setting (for example, the golf course, walking, bird watching).	west of Hockley and South East of Rochford Town. The north of this area, adjacent to the River Crouch contains less designated heritage assets compared to the rest of the area. While development in this area may not have any direct significant adverse impacts on designated heritage assets there could be indirect significant adverse impacts on their setting. Potential for significant adverse effects on informal recreational use of exposed and tranquil marshland areas to north and east.	Development in the north of the area, adjacent to the River Crouch, is less likely to directly impact designated heritage assets. However, HECZs 10 & 12 in the north are considered to be highly sensitive to change. The majority of Listed Buildings and Conservation Areas are contained in the central area of the District, to the east of this area from Canewdon in the north down to Paglesham in the south east. The capacity of the historic environment is dependent on a number of different factors, including the precise location and scale of development. It is also closely linked to the capacity of the landscape to accommodate further development. The majority of HECZs within this area are of medium sensitivity, where significant change could result in significant adverse effects on the historic environment. Other parts in the central Landscape Character Area have medium sensitivity with limited or unknown potential for amenity value.

Table 7.3b: Landscape Character Area of Dengie & Foulness Coast (See Figure 07)

Landscape Character Summary:
Distinctive extensive area of reclaimed marshlands, and of sweeping tidal mudflats and sands beyond the sea wall. An exposed landscape dominated by sky and / or sea views, with few interruptions (e.g. very few trees). Sparse settlement pattern, with limited accessibility and a military presence. Remote and tranquil character.
Includes **Living Landscapes Biodiversity Networks**: 49 Southend Sea Front & Maplin Sands; 79 Foulness Islands

Comprises **Historic Environment Character Areas (HECZs):** 1, 2, 3, 4, 5, 6 (in part); the ancient Broomway tidal path across the Maplin Sands (military testing grounds); **Archaeological Character Areas**: 9, 10
Includes **Conservation Areas:** Foulness
Includes **Scheduled Monuments:** Romano-British burial site on Foulness Island & Atomic Weapons Research Establishment Foulness Island, 1947 Explosives Storage Area.
Includes a number of **Listed Buildings.**

Includes **key recreational areas:** Essex Marina; Wallasea Island Wild Coast project (walking, cycling, birdwatching, painting, photography, reflection)
Open Space Settlement Areas: Canewdon (eastern third); Great Wakering/Barling/Foulness

Sensitivity: High	**Likely Impacts & Thresholds of Significance**	**Capacity: Low**
Large parts of the area are inaccessible due to the military presence. Highly valued landscapes with key habitats and species. Views are extensive and dominated by the sky and/or the sea. As a coastal area, it is subject to change but existing flood defences will be maintained. Wallasea Island is subject to a landmark conservation and engineering scheme of managed realignment, combatting the issue of	Development could result in the direct loss of character building habitats and landscapes. As existing infrastructure is limited, housing development may lead to increased demand for improved services, facilities and infrastructure and therefore more development, potentially including new roads which would dissect the landscape, reducing tranquillity, remoteness and affect the character of the area.	Access to much of the area is restricted due to MoD control of Foulness Island and Maplin Sands with munitions testing such that provision of additional housing is not a possibility. Development would significantly alter the special landscape character of the area, disturb key habitats and species in all areas, and disturb the special recreational attributes of this ancient wetland landscape of mudflats and saltmarsh, lagoons and pasture.

coastal squeeze and supporting natural habitats and rare species – managed by RSPB[88]. Settlement is sparse with poor connectivity. One Conservation Area: Churchend on Foulness indicative of the area's remoteness and inaccessibility. The area also contains two Scheduled Monuments and a number of Listed Buildings, the majority of which are located in Churchend. HECZs 1, 3 & 5 are identified as being highly sensitive whereas 2 & 6 have medium sensitivity. HECZ 4 (Wallasea Island) was identified as having low sensitivity. With the limited access, there is minor recreational value outside of the navigable waterways. The area is considered to be of **high** susceptibility and **high** value.	Development on Foulness Island would be likely to have an adverse impact of greater significance compared to other areas in terms of the historic environment, in particular designated heritage assets. Development is likely to require significant flood protection measures.	Development has the potential to significantly impact the character of the area, which could have adverse impacts on the setting of designated heritage assets.

[88] http://www.rspb.org.uk/discoverandenjoynature/seenature/reserves/guide/w/wallaseaisland/about.aspx

Table 7.3c: Landscape Character Area of South Essex Coastal Towns (See Figure 07)		
Landscape Character Summary: Urban development precedent, with open spaces and woodland surrounding the main settlements. Important Green Infrastructure, including important linkages with the Upper Roach Valley sited between the two main urban areas of Rayleigh to the west and Hockley/Rochford to the east. Prevalence of people and infrastructure, including a complex network of transportation routes with wider London connections. Surrounds and links with **Living Landscapes Biodiversity Network:** No 46 Upper Roach Valley (see table 7.3d) Comprises **Historic Environment Character Area Zones (HECZs):** 38, 39, 40, 34, 33, 30, 26, 27, 24, 21, 22, 23, 16, 17, 18, 19 Important WWII military defences at the airport; **Archaeological Character Areas**: 1 (in part), 3, 5 Includes **Conservation Areas of:** Rayleigh and Rochford Includes **Scheduled Monuments:** Rayleigh Castle & Rochford Hall Includes a number of **Listed Buildings.** Includes **key recreational areas:** Sweyne Park, The Rayleigh Windmill Museum, Rochford Hundred Golf Club, The Rayleigh Club Golf Resort, and Sutton Wharf. **Open Space Settlement Areas**: Rayleigh/Rawreth; Hockley/Hawkwell; Rochford/Ashingdon		
Sensitivity: Low to Medium with some key areas of High	**Likely Impacts & Thresholds of Significance**	**Capacity: Medium to Low**
The area is of mixed character and condition, containing key valued landscapes as well as poor quality development. It is densely populated and well connected to surrounding areas and inner London. HECZs: 16,18, 19, 21, 23, 24, 27, 30 (Hockley), 34, 38 – low to medium HECZs: 17 (airport), 22 (Rochford), 25 (Ashingdon), 26, 33, 39 (Rayleigh) – high sensitivity	As this area has been the main focus for previous development, it has the potential for becoming over saturated, including detracting from the important rural surroundings. Additional development around existing settlements has the potential to break down distinct boundaries and merge with loss of community identities.	These areas of Rayleigh, Hockley and Rochford around the Upper Roach Valley have some capacity for limited housing development, particularly in the west and south east. However, development is likely to decrease settlement gaps and contribute to the merging of settlements and coalescence in the Green Belt. Although this is against Green Belt principles (openness and permanence), these areas are the most connected and contained to support increased limited resident populations.

It includes key areas for green infrastructure providing important recreational and amenity services. There are 2 Conservation Areas, acknowledging the important cultural and historic values in Rayleigh and Rochford towns. There are also two Scheduled Monuments and a number of Listed Buildings. Generally the area is of low-medium susceptibility but with specific areas of high susceptibility, such as the historic town cores.	Focusing limited development in the existing urban areas has the potential to limit adverse impacts on the historic environment, although the historic town centres and settings are highly sensitive. The areas to the north west and north east of Hockley are also highly sensitive. Impacts on the recreational resources are uncertain but additional development in this area would be more easily accessible by sustainable transport options.	

Table 7.3d: Upper Roach Valley (See Figure 07)		
Landscape Character Area Summary: Rolling hills and slopes with extensive tree cover and shrub-covered skylines; dispersed settlements of individual farms; ancient woodlands, including Hockley Woods to the north. Includes **Living Landscapes Biodiversity Network:** No 46 Upper Roach Valley Comprises **Historic Environment Character Zones (HECZs):** 20, 31 **Archaeological Character Area**: 4 Includes a small number of **Listed Buildings.** Includes **key recreational areas:** Hockley Woods, Cherry Orchard Jubilee Country Park and the whole area's role as a green space providing informal recreation opportunities **Open Space Settlement Areas**: Rayleigh/Rawreth; Hockley/Hawkwell; Rochford/Ashingdon		
Sensitivity: High	**Likely Impacts & Thresholds of Significance**	**Capacity: Low**
This area is most susceptible to change with recreational pressures on the important woodlands. HECZs: 20 and 31 important native woodland with extensive evidence of historic assets - high sensitivity Important recreational facilities and services, Country Park, bridleways & footpaths, picnic & play areas **High** sensitivity	Development in this area would have adverse impacts on visual amenity, historic assets and the recreational focus.	The Upper Roach Valley is identified as key green infrastructure with strong recreational values supporting residents and habitats, including Hockley Wood and Cherry Orchard Jubilee Country Park. It is relatively undeveloped in a woodland and field-scape setting and as such has low capacity for new development. While there is not a significant number of designated heritage assets, the HECZs are considered to be highly sensitive.

8.0 SYNTHESIS

Environmental Capacity and Ecosystem Services

8.1 The capacity of the Rochford District environment to accommodate further housing development is difficult and complicated to determine since the concept is relative, relying on both quantitative and qualitative factors that are inter-related and can adapt. Supporting, provisioning and regulating services (see Diagram 1.1) are fundamental to the sustainability of our human ecosystem – air, water, food and shelter. Cultural services, so-called quality of life, including aesthetic, educational and recreational factors, are also important for contributing to human health and well-being.

Air Quality and Climate Change

8.2 The quality of air for human health and biodiversity health is primarily related to emissions from road traffic. Limits for certain pollutants are already being exceeded with an Air Quality Management Area designated in Rayleigh and in Chelmsford in the adjacent Borough to the north-west. The indications are that the roads to the west and south-west of Rochford District are at or near capacity and that a precautionary approach should be taken to consideration of additional housing development up to 2031 with associated increase in road vehicles and any further reduction in air quality. However, some mitigation is possible by discouraging the use of road vehicles through improving the provision of, and accessibility to, more sustainable transport such as walking, cycling and trains.

8.3 The control of carbon emissions to regulate climate change is agreed at international and national levels. There will be no carbon emissions arising from energy use for additional new housing development as building meets with the carbon neutrality targets set by the UK Government for 2016. Any additional carbon emissions will be associated with increased road transport. As above, some mitigation may be possible but this is largely beyond the control of the Council since people may choose to live in the Rochford District and travel elsewhere for work. The role of the Upper Roach Valley as a "green lung" for the District and surrounding areas with increased use as a recreational resource also needs to be managed carefully to minimise access by road.

Land, Soils and Minerals

8.4 The capacity of land and soils to accommodate more housing are associated with the loss or change of use of the land – once soils are developed upon, they are lost for other uses and with very limited possibilities for any mitigation. Some of the best and most versatile agricultural land (Agricultural Land Classification Grade 2-3) with soils supporting internationally protected marine biodiversity (birds for foraging and maybe roosting) is found in the eastern part of the District; loss of such soils and land would be unacceptable. The central area also includes high grade agricultural land (ALC Grade 1-3); additional studies may identify that some of the ALC 3 in the

northern part is grade 3b and thus of less significance. However, locally-grown food and retention of the provisioning ecosystem services of agricultural land is an increasing issue for sustainability (including the local economy) such that a precautionary approach should be taken. The western part of the District is the established urban area with only grade 3 ALC (compared to ALC 1-2 in the central area)and this land is considered to be the most able to accommodate change and absorb housing growth.

8.5 Development can improve the capacity of land by redevelopment on previously developed land. This is embedded in UK Government policy but further availability of such land is limited in the Rochford District. Mineral resources need to be extracted before land is developed. The central area of the District includes brickearth deposits that were important historically. However, the extent of safeguarded areas and likely future use of the brickearth resources is unknown.

Water (Resources, Quality and Flood Risk)

8.6 Water resources and quality are fundamental provisioning services for human health and biodiversity. The sustainability of water resource planning and management is debateable with regard to the boundaries defined for assessing capacities. The current approach in the UK endorses the acceptability of transporting water from areas of surplus to areas of need. The capacity of the water environment to accommodate such changes with regard to chemical and biological quality is considered through the conditions set by the Environment Agency for abstraction licenses and discharge consents. Water supply in the South Essex sub-regional area is provided by the Essex & Suffolk Water Company which asserts that there will be a surplus of supply through the planning period to 2040.

8.7 Planning and management of wastewater infrastructure are increasingly aware of a more sustainable approach, including consideration of ecosystem services and biodiversity needs. However, the location of wastewater treatment works (WWTWs) reflects previous approaches. Capacity studies consider the volumetric capacity of the systems to collect, transport and treat wastewater with limited consideration of the impacts on the ecological quality of the waters receiving the treated effluent with regard Habitats Regulations compliance. The South Essex WWTW Capacity Study (2014) indicates no constraints for identified development in the sub-regional area up to 2032. This assumes no increased effluent discharge beyond the licensed volume and it is unclear whether any increase in flow consent would meet with the required conditions for quality such that there seems some uncertainty regarding additional development.

8.8 Mitigation possibilities include water efficient development to reduce the requirement for additional capacity at WWTWs and the sewerage networks. Assessment of capacity needs to be considered with the relevant water company Anglian Water plc and at the sub-regional level, also taking into account any additional housing that the adjacent local planning authorities are investigating. A collaborative approach, including with the environmental regulators (Environment Agency and Natural England), will be needed to

determine the most sustainable option with regard to water efficient development and upgrading or provision of new WWTWs – which could have implications for funding, infrastructure phasing and delivery.

8.9 The eastern half and the northern edge of the Rochford District, in predominantly undeveloped rural areas, are characterised by a high risk of tidal and fluvial flooding with no capacity for accommodating additional development – unless proposals are designed and operated with water neutrality and do not contribute to any surfacewater run-off. There is some concern regarding the capacity of the existing flood defences to accommodate the predicted increase in flood risk. Current policy is to maintain the coastal protection by improving maintenance and upgrading defences where needed.

8.10 Much of the rest of the District is also at significant risk from flooding with Rochford and Hockley areas prioritised as Tier 1 locally important surfacewater risks (Essex LFRM, 2013)[89]. Opportunities for mitigating flood risk through implementation of Sustainable Urban Drainage Systems (SUDS) are limited by the impermeable underlying geology structure in the west of the District. There are likely to be some site specific locations that are suitable and sustainable with regard to flood risk for small housing proposals in the western developed part of the District; further detailed studies will be needed to determine the precise capacities.

Biodiversity

8.11 The eastern third of the District comprises internationally and nationally important biodiversity that could be adversely affected by indirect effects from increased traffic and recreational visits. A large part of this area is not accessible to the public and therefore, it may be considered that there is no capacity for additional housing. The farmland areas to the north and through the central area of the District could accommodate minor housing development without affecting the overall biodiversity character and value. Development would need to be directed away from sensitive biodiversity areas such as priority habitats and local wildlife sites. There may be opportunities to enhance linkages and mitigate for habitat fragmentation – all as part of an overall Green Infrastructure strategy.

8.12 The urban areas of Rayleigh, Hockley, Hawkwell and Rochford are least sensitive to change for biodiversity with less adverse impacts and opportunities for biodiversity enhancements through provision of Green Infrastructure as part of housing developments. There could be possibilities for biodiversity improvements and linkages into the Upper Roach Valley and the surrounding farmland areas to the north and east. However, it will be important to consider this in the context of management plans that aim to reduce the impacts of traffic and recreation on valued biodiversity. It is difficult to determine the precise capacity of these urban areas for further additional housing development without more detailed site specific studies for biodiversity.

[89] http://www.essex.gov.uk/Publications/Documents/Local_Flood_Risk_Management_strategy.pdf

People - Health & Well-being (Landscape, Recreation, Cultural Heritage & Historic Environment)

8.13 All human–environment interactions must consider conflicts and complements among diverse human needs within the limited capacities of ecosystems to meet those needs sustainably – and such needs change with time. Once basic health is secured through clean air and water, food and shelter, people's well-being is supported through cultural ecosystem services including aesthetic, spiritual, educational and recreational. Conflicts are apparent where land is used for quiet contemplation or active recreational activities. Landscape, designated heritage assets, biodiversity and associated amenities tend to define the character of areas – and it is against such integrated character that changes arising from additional housing development may be judged.

8.14 The landscape of the coastal area in the east of the Rochford District is characterised by ancient wetlands of mudflats and saltmarsh, lagoons and pasture. Access to most of the area is restricted due to MoD control of Foulness Island and Maplin Sands with munitions testing such that provision of additional housing is not a possibility. Development would significantly alter the special landscape and historic character of the area, disturb key habitats and species in all areas, and disturb the special recreational attributes for openness and wilderness such that there is no capacity for additional housing development.

8.15 For the farmland landscape, there is likely to be less capacity in the north and the east where there is more visual exposure to change. Development in the west of this area is likely to have the least impacts on landscape and heritage as it connects to existing development and infrastructure, and is an area where there is less likely to be prominent views. Development in the south east of the area may alter visual character to some extent but this could be limited by directing development towards the existing settlements. However, it should be noted that there a number of Listed Buildings as well as a Conservation Area and Scheduled Monument in the south east.

8.16 The town areas of Rayleigh, Hockley and Rochford around the Upper Roach Valley have some capacity for limited housing development, particularly in the west and south east. However, development is likely to decrease settlement gaps and contribute to the merging of settlements and coalescence in the Green Belt that covers most of the District. Although this is against Green Belt principles (openness and permanence) and would require release of Green Belt land, these areas are the most connected and contained to support increased limited resident populations. Nonetheless, loss of such land is likely to impact on landscape character. There are also important historic and conservation assets in the town areas, particularly in Rayleigh and Rochford.

8.19 The Upper Roach Valley is identified as key green infrastructure with strong recreational and amenity values supporting resident, visitor and habitat needs - includes Hockley Wood and Cherry Orchard Jubilee Country Park. It is

relatively undeveloped in a woodland and field-scape setting and as such has low capacity for new development. While there is only a small number of designated heritage assets the historic environment character zones in this area were identified as highly sensitive to change.

Environmental Capacity for Additional Housing Development

8.20 This Environmental Capacity Study has been desk-based using qualitative and quantitative information from published sources and other studies. It has aimed to inform spatial planning with regard to accommodating additional housing development of some 1,440 dwellings in the period 2026 up to 2031 (equivalent to 240 dwellings per year). It should be noted that a further review of the SHMA to take account of the most up to date guidance is being prepared to inform the early review of the Core Strategy. Judgments made are only indicative of environmental capacity issues and further more detailed site specific studies will be required. However, the study has identified those broad areas where there is no or limited environmental capacity for additional housing development and those broad areas where there are possibilities for further small scale housing developments.

8.21 Rochford District is rich in environmental character and assets – and as demonstrated by the overall environmental constraints presented in Figure 10. There is no environmental capacity for additional housing development in the eastern coastal and wetland parts that comprise internationally important biodiversity. There would appear to be only limited capacity for very small scale housing development in the central farmland areas due to the particular constraints on the capacities of the landscape character, agricultural land resources, and sustainable transport systems. Development would need to support the rural setting and character with sustainable design, and support improvements to Green Infrastructure.

8.22 There may be limited capacity for additional housing through small scale housing development near the existing urban areas – particularly with strong sustainable design, supportive of the Green Infrastructure strategy, and integrated with the existing settlement pattern. Most of Rochford District is in the Green Belt. Whilst this is perhaps not a specific environmental capacity topic *per se*, the principles that underpin Green Belt – of openness and permanence – align with the capacity of the landscape and communities to accommodate change. Site specific studies will be needed together with careful consideration of cumulative impacts. Acceptability of environmental impacts is likely to be associated with qualitative parameters and value judgments. Nonetheless, there are clear capacity constraints associated with road transport and air quality; biodiversity, landscape and agricultural land resources; and there may also be constraints on wastewater capacities.

8.23 From this desk-based study with available information, it seems uncertain that there would be the environmental capacity to accommodate 1,440 additional dwellings in the Rochford District and unlikely that the District could accommodate additional dwellings identified as needed from adjacent Council areas, although this is subject to review. Ultimately the precise location and scale of development will determine the significance of

impacts. Mitigation will also play an important role in helping to reduce the impacts of development and increase the potential for certain areas to accommodate further growth. This would need to be confirmed through more detailed and site specific studies. A sub-regional approach seems an appropriate way forward that acknowledges the key roles of Rochford District to protect the internationally important biodiversity/landscape, and to provide the "green lung" and enhance Green Infrastructure capacity, including for visitors from adjacent local authorities. Accordingly, the following recommendations are suggested:

Recommendations

8.24 Road transport is at or near capacity, with associated poor air quality and stress for road users (for both travellers and pedestrians in the urban areas with congestion). A challenge continues as to how to promote efficient movement of through traffic and to encourage more sustainable transport and movement in the South Essex area. This needs to be considered on a sub-regional transport impact assessment scale and to take into account the pressures from the nearby London conurbation.

8.25 It may be helpful to investigate the scope for enhanced local food production and security, including restoration of the traditional orchards and revival of local market gardens and allotments. How important is this to South Essex communities? A differentiation between Agricultural Land Grade 3a and 3b may be useful to inform any possibilities for small scale housing development in the western area of Rochford District.

8.26 There seems to be some uncertainty about the capacity of Wastewater Treatment Works in the South Essex sub-regional area to accommodate additional flow from more development and ensure that water quality requirements are maintained, including to support internationally protected biodiversity. It is recommended that a further Water Cycle Study is updated to take into account the additional housing identified through the review of the Thames Gateway South Essex Strategic Housing Market Assessment; this may also need to consider any additional housing needs from Chelmsford Borough.

8.27 Site specific studies to identify any small scale sites for housing development through infill and adjacent to the existing urban areas, particularly around the northern and western urban areas. This might comprise a Green Belt review approach in the first instance as the capacity issues identified from this desk-based study included retention of openness and visual amenity, and avoidance of further coalescence. Flood risk, impacts on local biodiversity and the historic environment will also be important. There may be scope with small scale developments for enhancements to Green Infrastructure. Nonetheless, it is uncertain whether the cumulative impacts of even small scale housing development will be acceptable.

APPENIDX I: Abbreviations and Glossary

AAP	Area Action Plan
ALC	Agricultural Land Classification
AQMA	Air Quality Management Area
Astronomical tide	Tidal levels and character resulting from gravitational effects – the earth, sun and moon
CBD	Convention on Biological Diversity
cumulative effects	Effects greater than the sum of individual effects
Ecosystem	*"A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit"*(CBD and MEA)
Ecosystem Approach	*"A strategy for the integrated management of land, water and living resources to promote conservation and sustainable use in an equitable way"* (CBD)
EIA	Environmental Impact Assessment
EMS	European Marine Site
Fluvial	Used in geography and geology to refer to processes associated with rivers and streams
green infrastructure (GI)	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. GI includes parks, open spaces, playing fields, woodlands, street trees, allotments and private gardens. www.planningguidance.planningportal.gov.uk
HECA	Historic Environment Character Area
HRA	Habitats Regulations Assessment
LCA	Landscape Character Area
LPA	Local Planning Authority
LWS	Local Wildlife Site
MEA	Millennium Ecosystem Assessment (UN)
NVZ	Nitrate Vulnerable Zone
RBMP	River Basin Management Plan
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SHMA	Strategic Housing Market Assessment
SSSI	Site of Special Scientific Interest
WRZ	Water Resources Zone
WWTW	WasteWater Treatment Works

APPENDIX II: Key Stakeholder Workshop November 2014

Rochford District Council Offices, Civic Suite, Rayleigh Information Centre, 2 Hockley Road, Rayleigh SS6 8EB

Invited:	Attended ✓ Apologies **x**
Cheryl Beattie – Enfusion (CB) (notes)	✓
Alison Bennett - Essex County Council (AB)	✓
English Heritage Representative	**x**
Environment Agency Representative	**x**
Annie Gordon – Essex Wildlife Trust (AG)	**x**
Richard Hatter - Thurrock Borough Council (RH)	✓
Natalie Hayward - Rochford District Council (NH)	✓
Samuel Hollingworth - Rochford District Council (SH) (Chair)	✓
Natural England Representative	**x**
Helen Nightingale - Basildon Borough Council (HN)	✓
Alastair Peattie - Enfusion (AP) (Facilitator)	✓
Laura Percy - Chelmsford City Council (LP)	✓
Amanda Raffaelli – Castle Point Borough Council (AR)	**x**
Lesley Stenhouse - Essex County Council (LS)	✓
Richard Tatton-Bennett – Rochford District Council (RTB)	**x**
Matthew Thomas - Southend Borough Council (MT)	✓
Velda Wong - Rochford District Council (VW)	✓

1. SH welcomed and introduced everybody, and provided an overview of the purpose of the EC study.

2. AP introduced the method and approach. Invited informal discussion, working through the key findings of each theme.

3. **Theme: Air**. Summary findings were agreed. LP reported how development has occurred within an AQMA in Chelmsford. SH recognised that development will have potential effects for neighbouring authorities. Agreed that the greatest impact on air quality will be along the A127, where HN has noted a capacity issue, and LS has noted that although medium term improvements are in place, long term solutions are required. LP noted that overall the A130 is not a particular issue, but rather a particular junction (Fairglen Interchange) within it that is a known issue. MT noted that monitoring air quality will be a requirement for new development within the London Southend Airport Joint Area Action Plan area extension area.

4. **Theme: Land and Soils**. Summary findings were agreed. RH raised the issue of landfill. LS advised that there are a number of permitted landfills in the area that will need to be taken into account; any future landfill sites will be restricted by tighter locational constraints. LS also mentioned the specialist Tree Fella tree/green waste composting operation near Great Wakering that may need consideration; there are issues with bio aerosols and the EA a 250m consultation requirement.

5. **Theme: Water**. Summary findings were agreed. LS advised that the emerging Essex and Southend Waste Local Plan will provide information updates for the Waste Water Treatment Works (WWTW) section. NH noted that the study has used the most recent information from the emerging Waste Local Plan. All agreed that WWTW has limited available information at present. MT advises that there are no capacity issues in Southend. AP recognises that the Water Framework Directive is another relevant issue (requirements are unlikely to be met). SH confirmed that there is not a requirement to differentiate between flood zones 3a and 3b as, for the purposes of this study, both are seen as absolute constraints. The differentiation however is contained within the Strategic Flood Risk Assessment (SFRA). SH noted that the HRA for the Basildon Local Plan identified issues with regard to consented discharges and European sites. SH recognises that the cumulative effects of adding further development to that assessed (originally contained within the policy framework) has not been considered.

6. **Theme: Biodiversity**. Summary findings were agreed. MT advised that the recent HRA for the Southend Development Management DPD has updated information for European sites which may assist Enfusion in the study. Enfusion to consider this updated information within the study. SH noted that Natural England has had previous issues with the recreational pressures on biodiversity arising from development. LS advises that the Green Grid Project has mapped green corridors. LS advised that the ecology team is actively involved in Wallasea Island, and more information might be available from them. VW advised that there is a recent unpublished SEA baseline that Enfusion can view. VW to provide unpublished SEA baseline.

7. **Theme: People**. SH confirmed that all authorities have carried forward the Coastal Belt Protection designation and Landscape Character Areas. AB endorsed the use of the Historic Environment Character Areas study (included within the draft report) as these are useful in portraying the value of undesignated heritage assets. SH recognised that the A130 is viewed as a landscape corridor across three districts, and recognises that development in this area could be an issue. MT advised significant road capacity constraints for any new development along the border of Southend and Rochford.

8. Implications for spatial planning: SH would like to see the synthesised map without the Green Belt, and recognises that there must be a point when the Green Belt can no longer be considered a constraint. LS recognised that the key issue arising will be challenging the Green Belt. National Legislation protecting the land is the only factor considered to be an absolute constraint, there is potential for mitigation of all other effects. RH also acknowledged the need to factor in the Greater London Authority Plan which may direct more development towards the local authorities.

   There were no further comments from the neighbouring authorities and SH closed the meeting.

Actions:

i Enfusion to consider the recent HRA for Southend Development Management DPD in the biodiversity theme
ii Enfusion to consider the Green Grid Project in the biodiversity theme
iii Enfusion to complete EC Report early 2015; RDC to distribute to key stakeholder group for comment and then consider any follow-up meeting
iv RDC to consider what could be delivered and where; consider mapping areas to avoid and potential development areas

APPENDIX III: Responses to Representations Received

Rep Ref	Report Ref	Comment	Response
Natural England			
1.1	EC Report	Natural England considers that the coverage of the issue of recreational disturbance to wildlife, particularly the wintering bird interest features of the SPA and Ramsar sites, is perhaps a little too simplistic. We would have preferred to see more consideration given to such issues as the factors governing recreational choices, particularly by dog-walkers, and mechanisms by which the potential impacts can be mitigated (eg through the provision of suitable attractive recreational spaces closer to the new development). With this exception, Natural England is satisfied that the Environmental Capacity Study adequately addresses all of the issues relevant to our statutory remit.	Noted. The study provides a high level consideration of constraints and potential capacity of the environment to accommodate further development. Recreation is now identified as a key issue for the sites in Section 6. The findings will help the Council to identify areas for further study and more detailed consideration. The study is a piece of evidence that will help to inform decision-making.
Historic England			
2.1	People Theme – Para 7.57 and Tables 7.3a-d	In terms of the draft Environmental Capacity Study for Rochford, we welcome the inclusion of the historic environment as a key topic and reference to historic environment character areas and zones. However, the combining of landscape, recreation and cultural heritage into one 'people' theme runs the risk of underplaying the importance of heritage assets when assessing overall sensitivity, significance and capacity. This is perhaps demonstrated by paragraph 7.57 and the limited reference to the historic environment as key issues arising from the baseline information, as well as the assessment in Tables 7.3(a) to (d) (see below).	Noted. As an environmental capacity It was considered important to ensure that interrelationships were given appropriate consideration. Heritage has links to a number of other topics as it can be affected by housing and employment, as well as the natural environment and climate change and flooding. The protection and enhancement of heritage assets can also have indirect positive effects on communities and health. The study does not seek to underplay the importance of heritage but rather tries to ensure that the interactions and key links between the various topics/constraints are given appropriate consideration.
2.2	Para 7.41	We would like to clarify in paragraph 7.41 that there are six scheduled monuments in Rochford and 17 Grade II* listed buildings.	Noted and amended.

Rep Ref	Report Ref	Comment	Response
2.3	Figure 9	Figure 9 appears to show all six monuments as well as Grade II* buildings, although it is difficult to distinguish between Grade II* and Grade II buildings due to the colours used.	Noted, however this is not considered of significance given the strategic, high level nature of the study.
2.4	Maps	It would be helpful to map the historic environment character areas and zones to see how they correlate with other datasets.	Noted. A link to the Historic Environment Characterisation Project is provided in Para 7.42, Footnote 86, which allows any interested parties to view maps of the areas/zones.
2.5	Para's 7.26 and 7.27	In paragraphs 7.26 and 7.27 there is an overemphasis on poor quality development in the South Essex Coastal Towns area, when there are a number of heritage assets including conservation areas within the town centres.	Noted and disagree. There is only one reference to poor quality development in Para 7.27 and this arose from a piece of evidence, the 2003 LCA.
2.6	Table 7.2	In terms of effects of development, Table 7.2 correctly refers to impacts on heritage assets, although it could refer to NPPF terms such as significance and harm (see paragraphs 126-141 of the NPPF).	Noted and agreed. Table 7.2 has been amended to include these terms.
2.7	Tables 7.3a-d	Tables 7.3(a) to (d) take a landscape character area approach to the overall theme, with the historic environment forming part of each landscape area. While this approach helps to provide a coherent geographical unit, it does not carry out a proper assessment of the significance of heritage assets and the potential for impacts on that significance (see the above advice notes for further guidance). We have not been able to assess the findings of Tables 7.3(a) to 7.3(d) in any detail, but would caution against any definitive conclusions regarding historic environment impacts without further assessment of significance and setting. While the tables refer to conservation areas and archaeology, there is no reference to listed buildings or scheduled monuments and it is not clear how these features have informed the assessment.	Noted. The study provides a high level consideration of constraints and potential capacity of the environment to accommodate further development. The findings will help the Council to identify areas for further study and more detailed consideration. The study is a piece of evidence that will help to inform decision-making. More detailed consideration of the significance of heritage assets and the potential for impacts on that significance will be carried out at a lower level of plan-making and assessment. A reference the Historic England guidance for Local Plans has been provided in Section 7. Listed buildings and scheduled monuments have now been included in Tables 7.3a to d.
2.8	Conclusions	We note the conclusions that the district has limited environmental capacity for additional housing development. In locations where there might be scope for development, we would expect any detailed site	Noted and agreed.

Rep Ref	Report Ref	Comment	Response
		specific studies of capacity and cumulative impact to include the historic environment as a key topic.	
Essex County Council Historic Environment Team			
3.1	Table 7.3b	Table 7.3b lists the HECZs in the summary (p81) but does not then mention any impacts for the Historic Environment. All the other tables do.	Noted and agreed. Tables 7.3a to d have been amended to take account of this representation.
3.2	Section 8	Chapter 8 Synthesis only makes a very brief reference to Historic Assets for the South Essex Coastal Towns. Despite Historic environment assets being assessed for all the landscape areas, this is not reflected in the synthesis, which seems strange particularly as two of the areas have been assessed as having high sensitivity for the historic environment. The synthesis needs to reflect this.	Noted and agreed. Section 8 has been updated to reflect this representation.
RSPB			
4.1	Pg 45-47	The RSPB welcomes the detailed policy context on pages 45 to 47. We note that the Natural Environment and Rural Communities (NERC) Act 2006 has been referenced in paragraph 6.27(page 53), but we recommend that this also be mentioned in the Policy Context chapter too. This would further identify and capture the range of species and habitats afforded protection by it.	Noted and agreed. The NERC Act 2006 has been included within the policy context.
4.2	Para 6.14	We note the comments in 6.14 (page 48) regarding the lack of information on the current conservation status of individual European sites. Where these overlap with Sites of Special Scientific Interest (SSSIs) there will be Condition Assessments information that could be drawn upon. The RSPB would expect Natural England to hold the relevant information.	Noted. The condition status of SSSIs within the District are provided in Table 6.4.
4.3	Para 6.14	In addition, it would be useful to tabulate or clearly reference the vulnerabilities of European sites. The vulnerabilities and threats are captured within Natura 2000 Standard Data Forms, assessments of Favourable Conservation Status and the recent Site Improvement Plans produced by Natural England. This would provide clarity on the type of information required to understand future impacts on such sites and the measures required to ensure adverse effects on site integrity are avoided.	Noted and agreed. The key priority and key issues identified within the Site Improvement Plan for the Essex Estuaries have been included in Section 6.

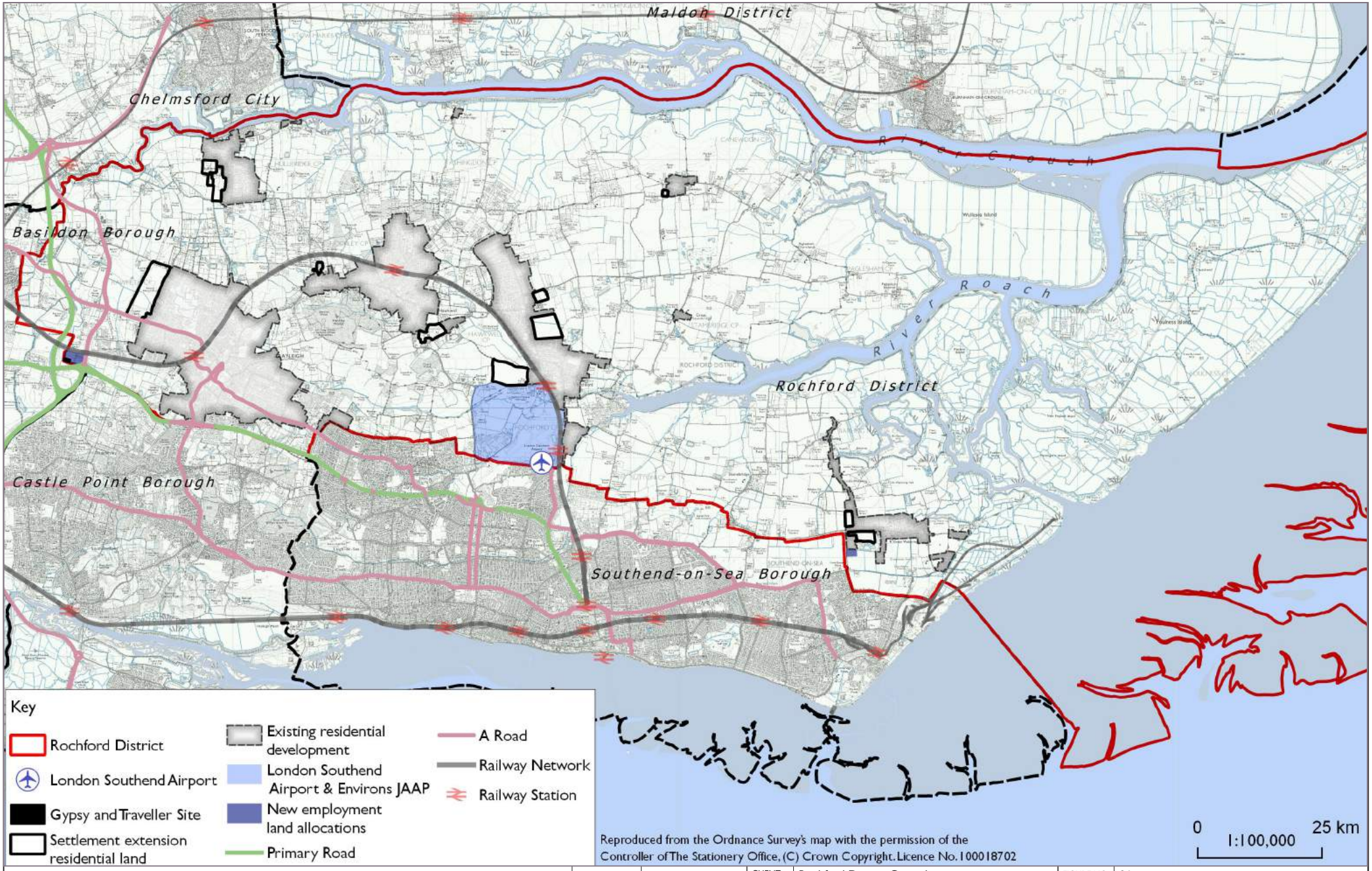
Rep Ref	Report Ref	Comment	Response
4.4	Table 6.3	Recreational pressure and predation have been identified as two key threats for breeding little terns (table 6.3 on page 49). Whilst we appreciate that this table relates to a high level report, we feel that it is important that these factors are clearly identified here in the last column. Management at Wallasea has included habitat creation to benefit breeding little terns, whilst historically Foulness supported a colony of 360 pairs2. The Council therefore must take steps to ensure the species is protected fully. Little tern is one of the rarest breeding seabirds in the UK and requires coordinated management action to maintain it.	Noted, Table 6.3 has been amended to reflect this representation.
4.5	Para 6.18	The information provided in paragraph 6.18 (page 50) regarding the hen harrier relates to their UK breeding population. The Special Protection Areas (SPAs) within Rochford are designated for their wintering population only. This should be amended for accuracy.	Noted and agreed. Para 6.18 has been updated to reflect this representation.
4.6	Para 6.21	The RSPB is pleased to see this subject recognised in paragraph 6.21. There is further opportunity here to recognise the Environment Agency's Shoreline Management Plan and to map areas for potential management realignment or regulated tidal exchange. Coastal squeeze is a concern for saltmarsh and other coastal habitats that support breeding and wintering waders, wildfowl and raptors that are protected species and/or features of sites of European and national importance. Ensuring that local policy is suitably strong to manage the coast effectively in the future is essential.	Noted.
4.7	Para 6.27	The state of the UK's birds 2014 identifies a range of species of conservation concern including those identified in the Essex and Rochford Biodiversity Action Plans (BAPs) in paragraph 6.27 on page 53. However, there are a few bird species of conservation concern that the RSPB consider should be added to the list. These are: corn bunting, lapwing, turtle dove and yellow wagtail. These species are the focus for the RSPB's work with landowners and should be target species for benefits from agri-environment schemes. For example, we have already lost 96% of the UK breeding turtle doves and there is a real risk that it could be lost as a breeding species within the next ten years. Understanding the distribution of these species of conservation concern will provide the council with information to help decision-making on	Noted. Section 6 has been updated to reflect this representation.

Rep Ref	Report Ref	Comment	Response
		additional housing requirements referred to in paragraph 1.2 (page 6) and measures that could be implemented to make a real difference for these species. The RSPB in conjunction with the Essex Birdwatching Society conducted a county-wide survey for corn buntings in 20074, which is being repeated this year (2015).	
4.8	Para 6.29	The Wallasea Wild Coast project sits within the Greater Thames Futurescape and will cover over 600 hectares when completed. Overall, this landscape-scale conservation initiative covers an area from the inner Thames to Margate in the south and beyond Clacton in north Essex. This project aims to deliver large scale habitat creation and species conservation, whilst providing an attractive and inspirational area for people to visit. The RSPB recommends that this be included in paragraph 6.29 on page 54 given the contribution it will make to local ecological targets and social benefits.	Noted and agreed. Section 6 has been updated to reflect this representation.
4.9	EC Report	The RSPB is keen to emphasise the multi-functional benefits of GI to biodiversity, amenity, recreation and health and wellbeing and the need to consider GI in urban design and demonstrate how GI and green and open spaces could link to the wider GI network and interlink with access, the landscape and biodiversity. An example of good practice can be found in the Exeter Residential Design Guide from which the RSPB recommends the following objectives: ▪ to promote the conservation and wise use of land and protect and enhance the landscape character of the district ▪ to conserve and enhance the biodiversity of the district ▪ to maintain a high quality environment in terms of air, soil and water quality.	Noted. The importance of and potential positive effects of green infrastructure are mentioned throughout the report.
Basildon Borough Council			
5.1	EC Report	The approach taken to assessing the capacity of the environment to accommodate growth by looking at the different constraints appears reasonable. However, we are of the view that three main issues can be identified, which need to be addressed to improve the robustness of the report: ▪ The scale of the evidence reviewed in some instances;	Noted.

Rep Ref	Report Ref	Comment	Response
		▪ The assumptions applied to development; and ▪ The approach taken to mitigation within the report.	
5.2	EC Report Evidence Base	This primarily relates to evidence associated with landscape issues. The evidence base relied upon is extracted from higher level landscape appraisals, and only provides an overview of wider character areas within Rochford District. No detailed consideration has been given to landscape character areas at a more local level, and as such any conclusions can only be very high level as they exclude wide areas of the borough where some discrete development opportunities may exist, and equally direct development towards other areas where some landscape features may require protection. It is also noted that the landscape evidence relied on is somewhat dated, although given its high level nature, this is unlikely to be an issue as change is unlikely to have affected the general landscape characteristics of these wider areas. Work to resolve this issue is likely to take some time, however a more detailed review of the landscape character within Rochford may be an appropriate recommendation of the report, given the issues with the existing evidence being relied upon.	Noted. The study provides a high level consideration of constraints and potential capacity of the environment to accommodate further development. The findings will help the Council to identify areas for further study and more detailed consideration. The study is a piece of evidence that will help to inform decision-making. Further detailed landscape and visual assessments at a local level were outside the scope of this high level study. It should be noted that the report does not state that development should not occur ion areas of high constraint. This will be dependent on further detailed studies at a local level. Conversely, an area of low constraint does not mean that development is acceptable within that area.
5.3	EC Report	As a general comment, the report tends to focus on the negative implications of development. There is limited reference to the positive opportunities that can arise from development. For example, there is no legal requirement for landowners to protect and improve Local Wildlife Sites. Nearby development can be used to bring these areas under management, achieving a net gain in biodiversity. Another example is the provision of public open space within development sites. This brings land into public use which would otherwise remain inaccessible.	Noted. Potential opportunities as a result of development have been identified, where necessary, within Table 4.2, 5.2, 6.5 & 7.2.
5.4	Para 8.23	As a more specific comment, a conclusion is reached with regard to the ability of Rochford District to accommodate housing growth in the future at paragraph 8.23 without sufficient information to justify such a conclusion. There is no conclusion arising from the assessment on the likely amount of land that may be available for development purposes. Furthermore, there is no information presented on the expected densities of development that could be achieved on development	Noted. This is a strategic level study and as stated in Para 8.23, the findings are subject to review and would need to be confirmed through more detailed and site specific studies as well as further technical work, such as the updated Strategic Housing Land Availability Assessment.

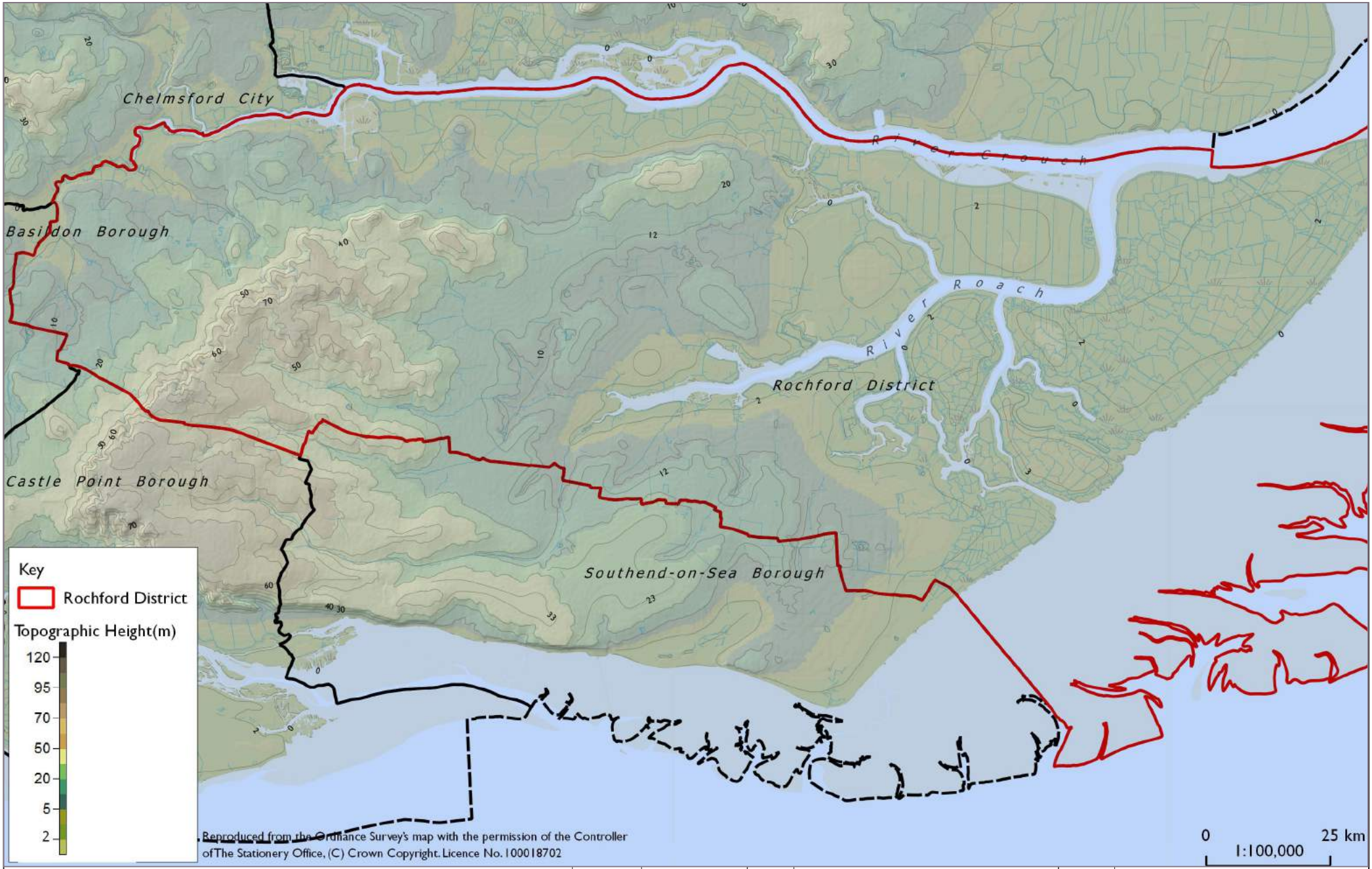
Rep Ref	Report Ref	Comment	Response
		sites. Without this type of information it is not possible to reach the conclusion presented.	
5.5	EC Report	It is also assumed that any development that is delivered, will be small scale development on the edge of existing settlements. It is unclear as to how this spatial approach to the distribution of development arose from the study, or whether other spatial approaches have been considered. Consideration should be given to other spatial approaches, because whilst it is recognised that small scale development may have less visual impact on the environment, it is not able to contribute as effectively to the transport related issues raised. Other approaches may present opportunities to deal with the environmental capacity issues in a more proactive way.	Noted. This is a reasonable assumption to make given the historic distribution of development in the District and the proposed spatial distribution of future growth set out in the adopted Core Strategy. The Council will give consideration to all reasonable options for the quantum and spatial distribution of development based on available evidence, including updated Strategic Housing Market Assessments, Strategic Housing Land Availability Assessments and other technical studies, including landscape assessments and transport modelling. The findings will help the Council to identify areas for further study and more detailed consideration.
5.6	EC Report	There are mentions throughout the report of mitigation. However, these are buried within the text and not adequately highlighted either in the summary boxes at the end of each section, or within the conclusions and recommendations. Given that there are existing issues with flood risk and air quality for example, and given that there is pressure for Rochford to accommodate some additional development going forward, more focus should be given to the mitigation that should be delivered to improve, or provide environmental capacity. This information will not only assist with the identification of development capacity, but will also enable Rochford District Council to draft a more robust list of infrastructure (inc. Green Infrastructure) requirements to be delivered alongside any new development.	Noted. Para 8.23 has been amended to state that mitigation also plays an important role in helping to reduce the impacts of development and increase the potential for certain areas to accommodate further growth. Further more detailed studies will be able to consider potential mitigation in more detail.

APPENDIX IV: FIGURES



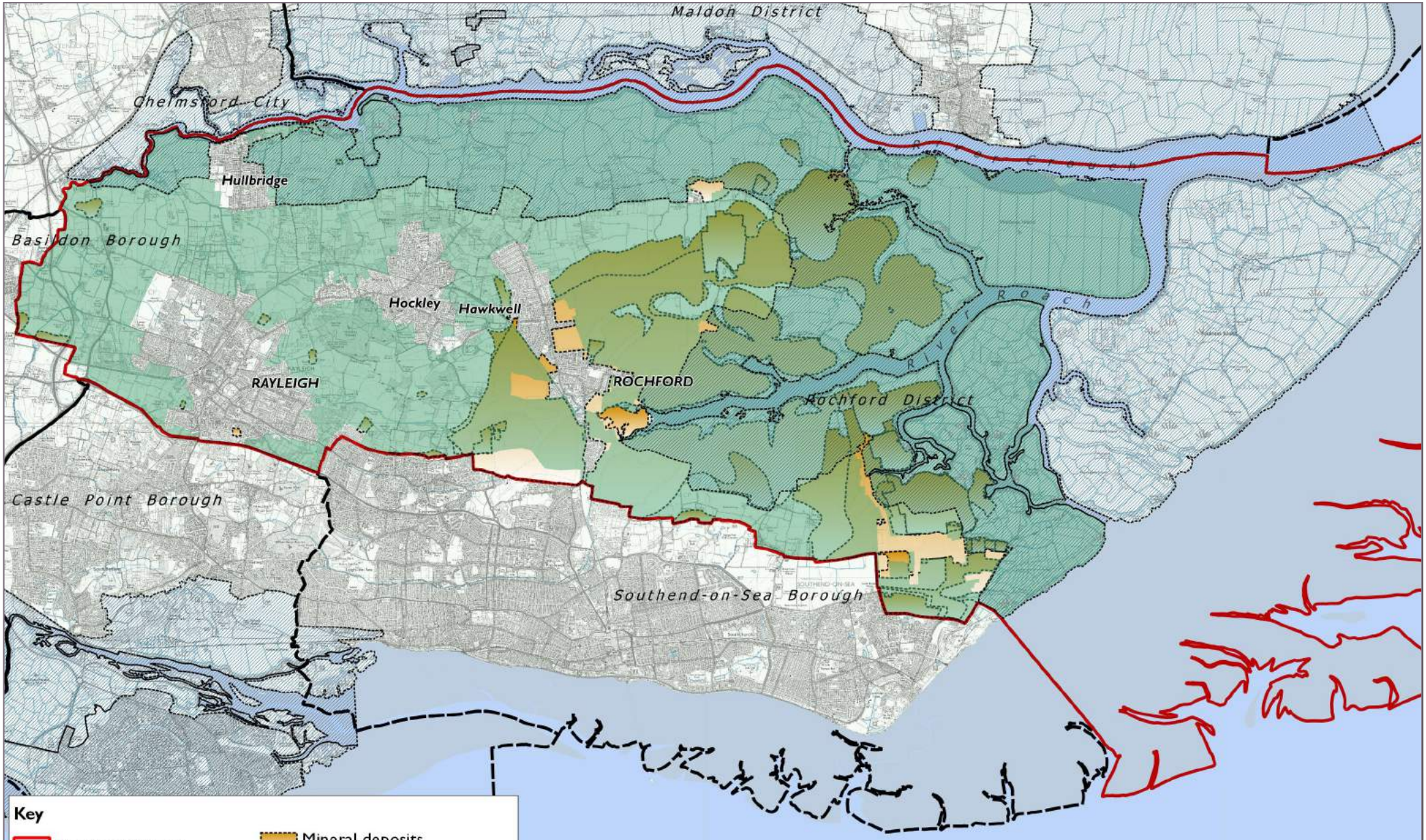
NPA on behalf of enfusion

		CLIENT:	Rochford District Council	FIGURE NO:	01
DATE:	January 2015	PROJECT:	Rochford District Environmental Capacity Study	TITLE:	Location and Development
ISSUE STATUS:	**FINAL**				



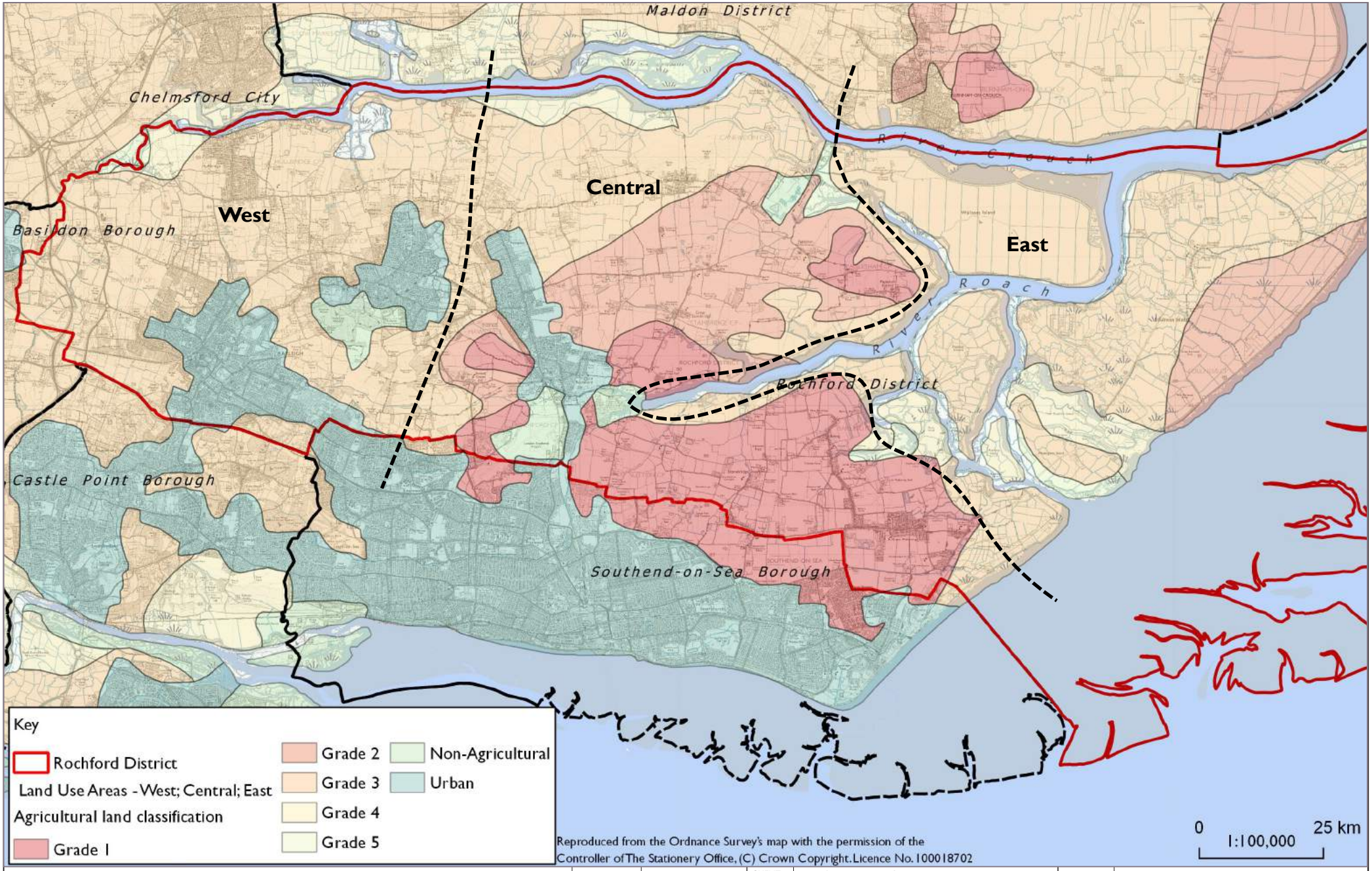
NPA on behalf of enfusion

DATE:	January 2015	CLIENT:	Rochford District Council
ISSUE STATUS:	**FINAL**	PROJECT:	Rochford District Environmental Capacity Study
FIGURE NO:	02	TITLE:	Topography



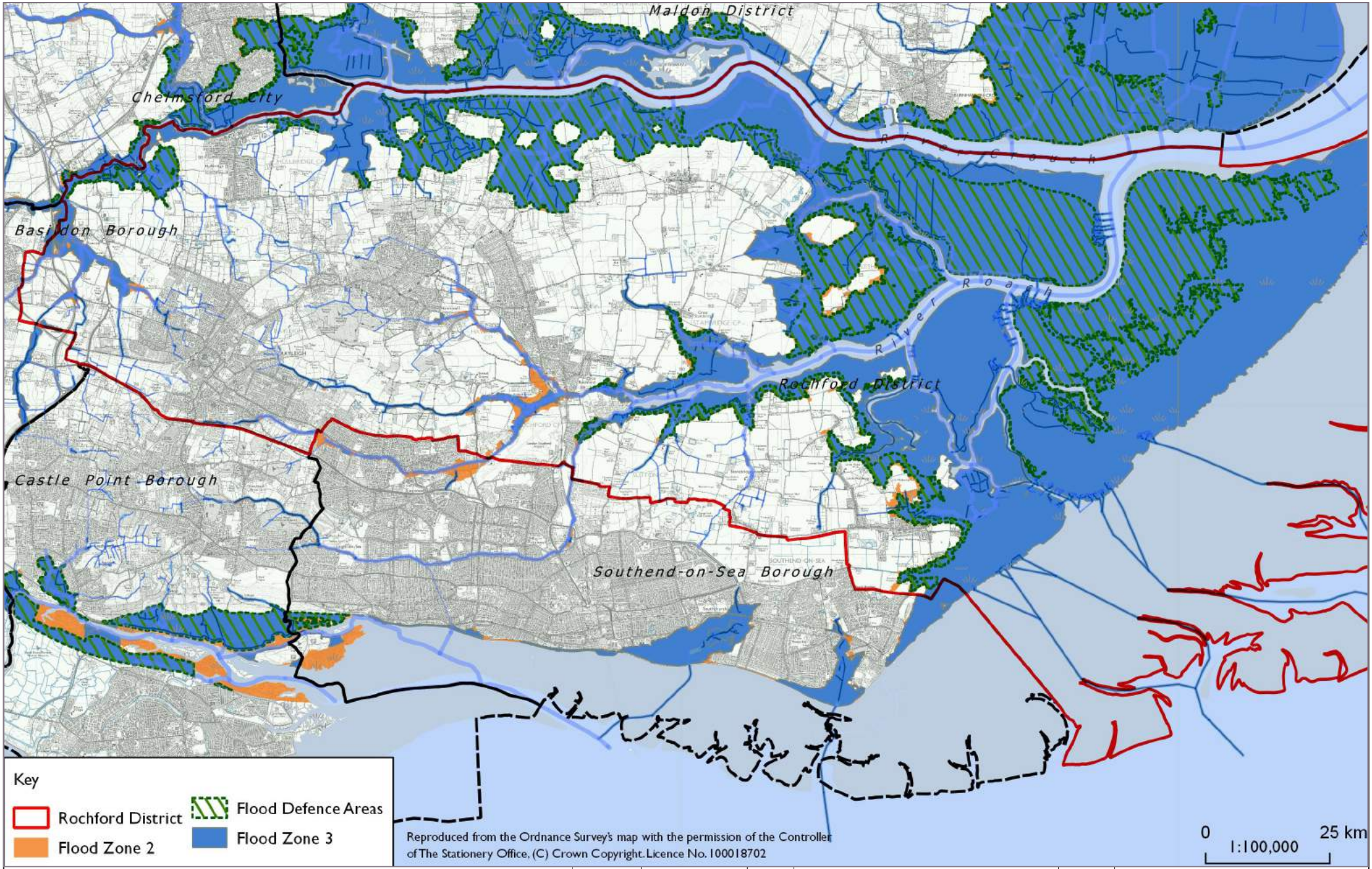
NPA on behalf of enfusion

DATE:	January 2015	CLIENT:	Rochford District Council
ISSUE STATUS:	FINAL	PROJECT:	Rochford District Environmental Capacity Study
FIGURE NO:	03	TITLE:	Planning Context



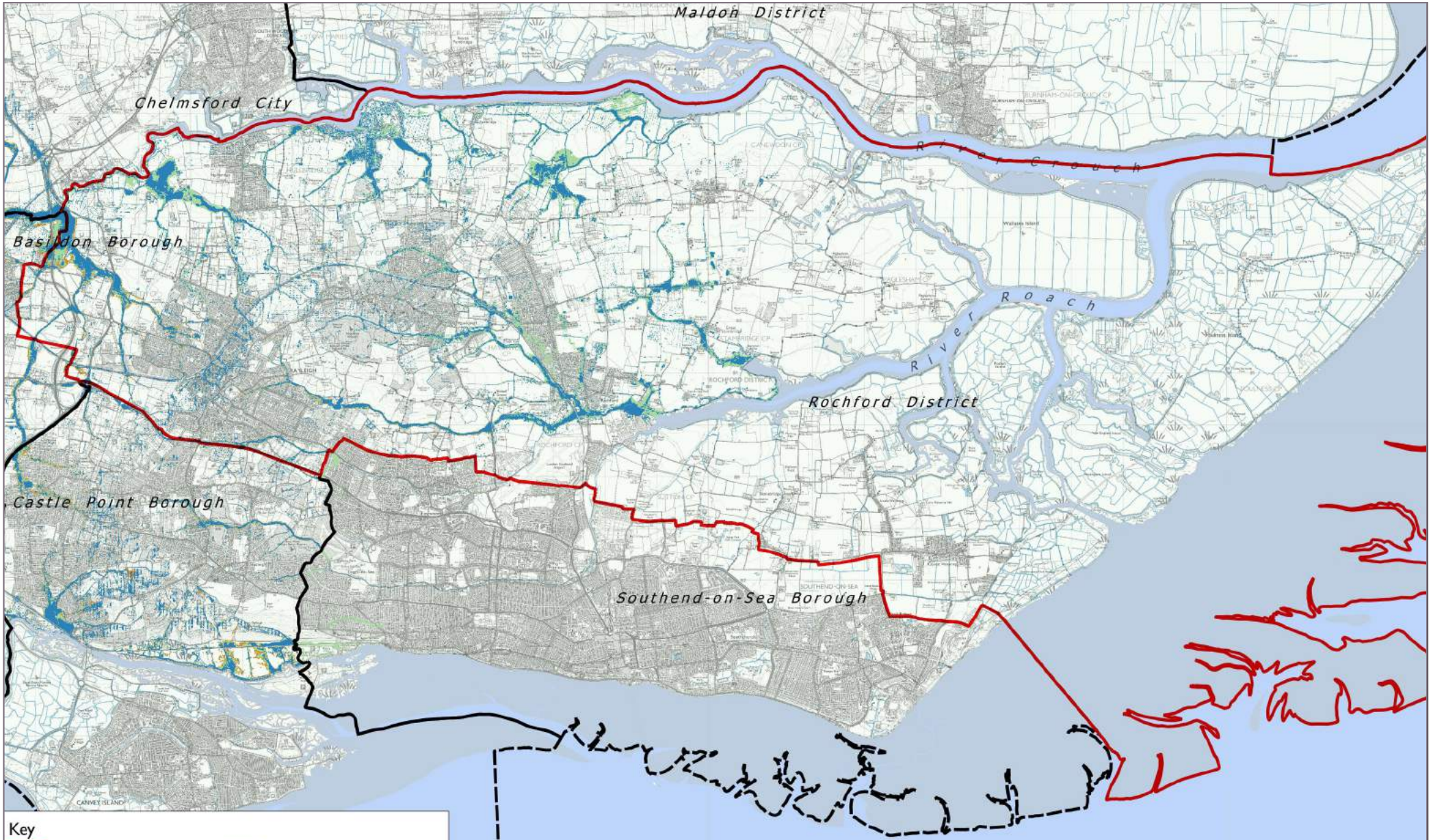
NPA on behalf of enfusion

		CLIENT:	Rochford District Council	FIGURE NO:	04
DATE:	January 2015	PROJECT:	Rochford District Environmental Capacity Study	TITLE:	Soils
ISSUE STATUS:	**FINAL**				



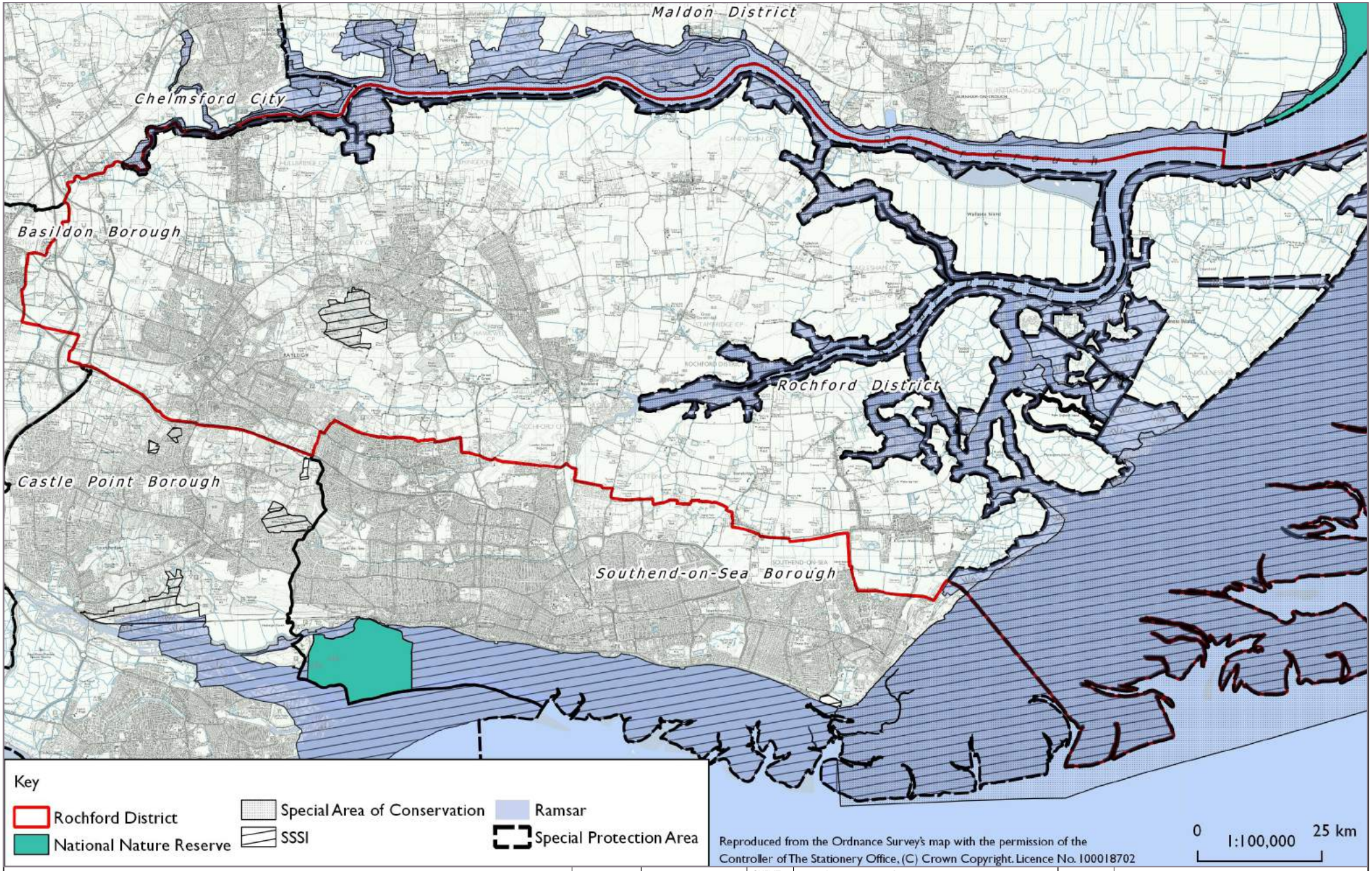
NPA on behalf of enfusion

		CLIENT:	Rochford District Council	FIGURE NO:	05a
DATE:	January 2015	PROJECT:	Rochford District Environmental Capacity Study	TITLE:	Fluvial and Tidal Flood Risk
ISSUE STATUS:	**FINAL**				



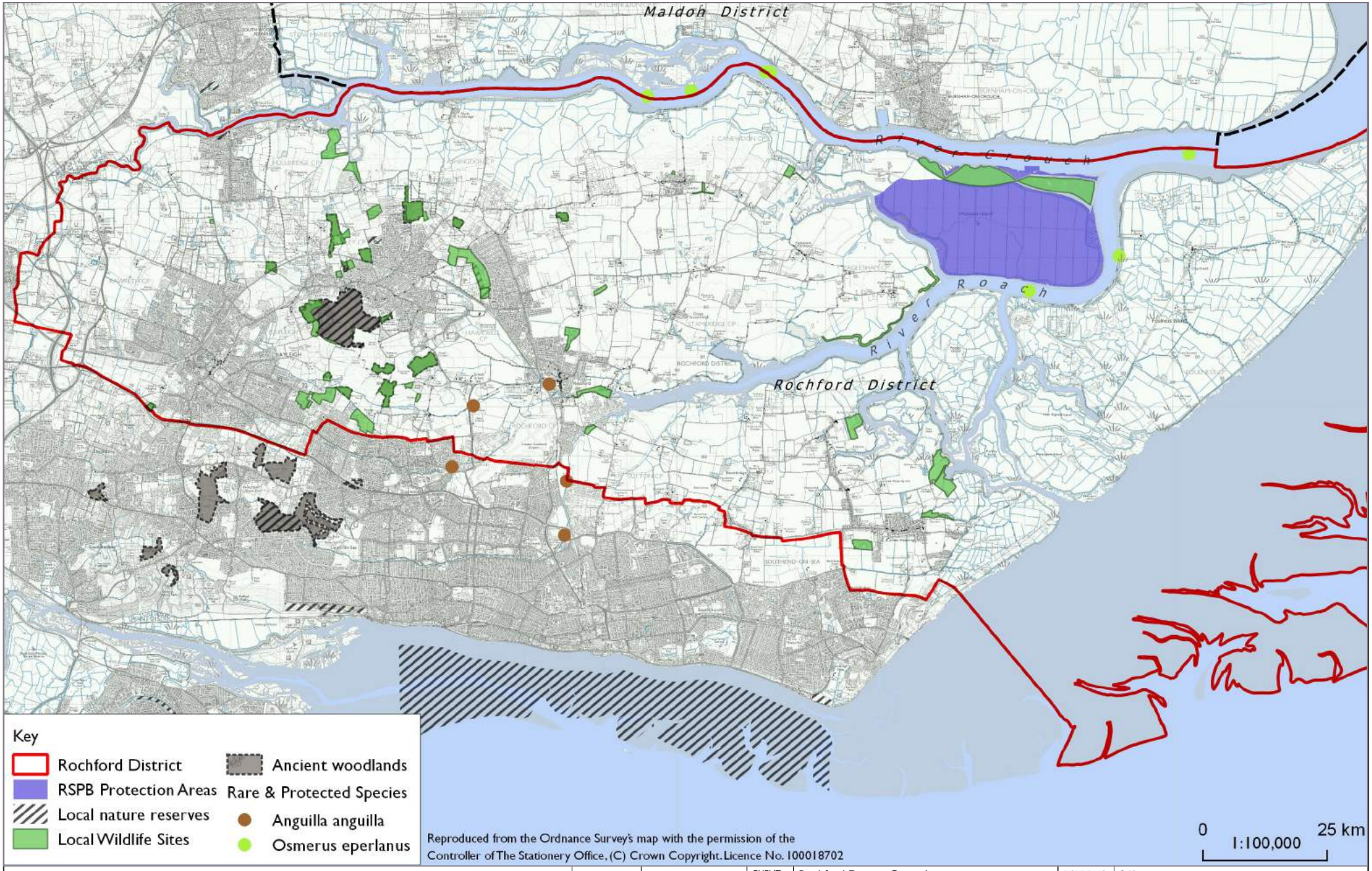
NPA on behalf of enfusion

		CLIENT:	Rochford District Council	FIGURE NO:	05b
DATE:	January 2015	PROJECT:	Rochford District Environmental Capacity Study	TITLE:	Surface Water Flood Risk
ISSUE STATUS:	**FINAL**				



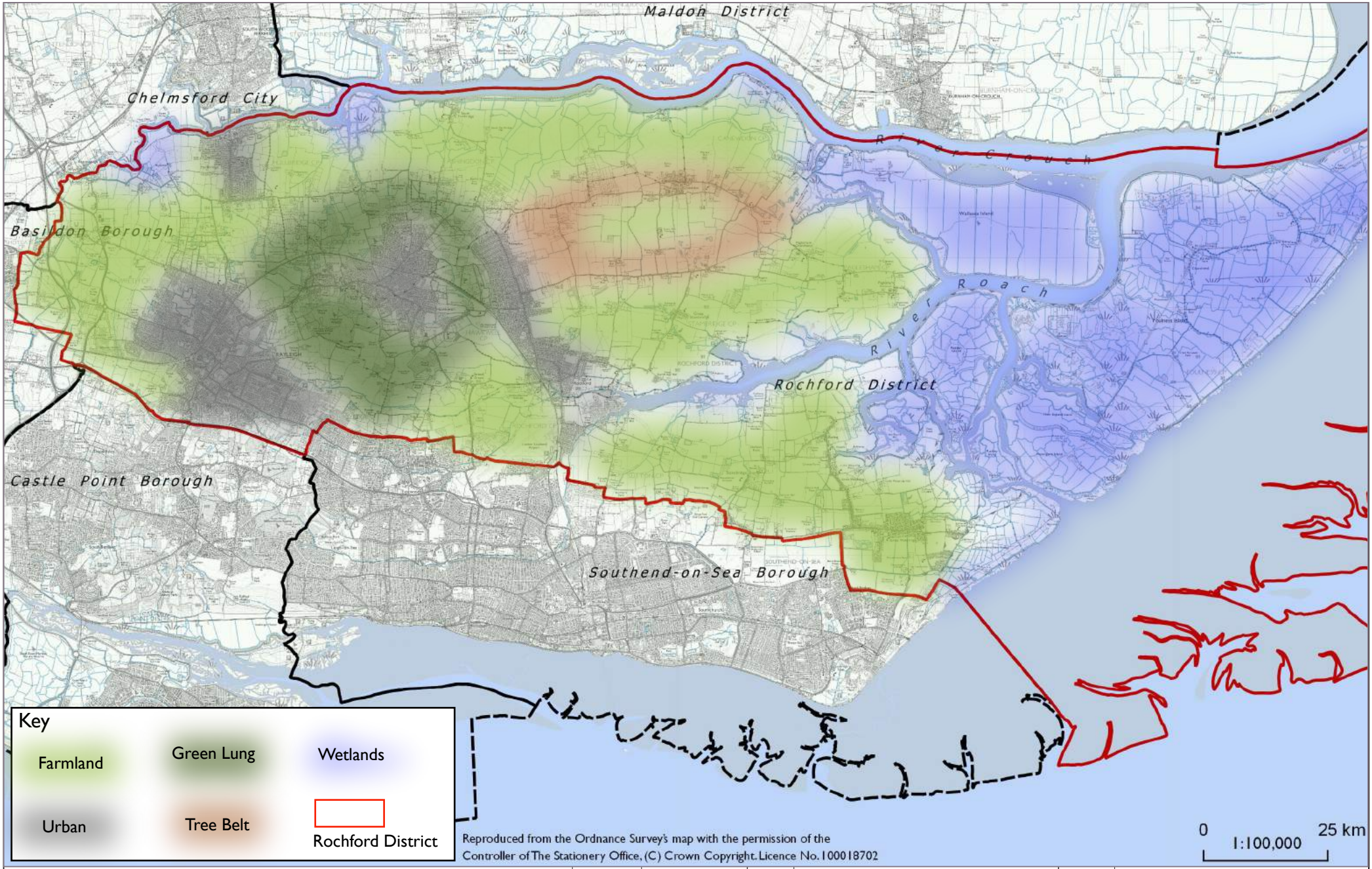
NPA on behalf of enfusion

		CLIENT: Rochford District Council	FIGURE NO: 06a
DATE:	January 2015	PROJECT: Rochford District Environmental Capacity Study	TITLE: International and nationally designated biodiversity
ISSUE STATUS:	**FINAL**		



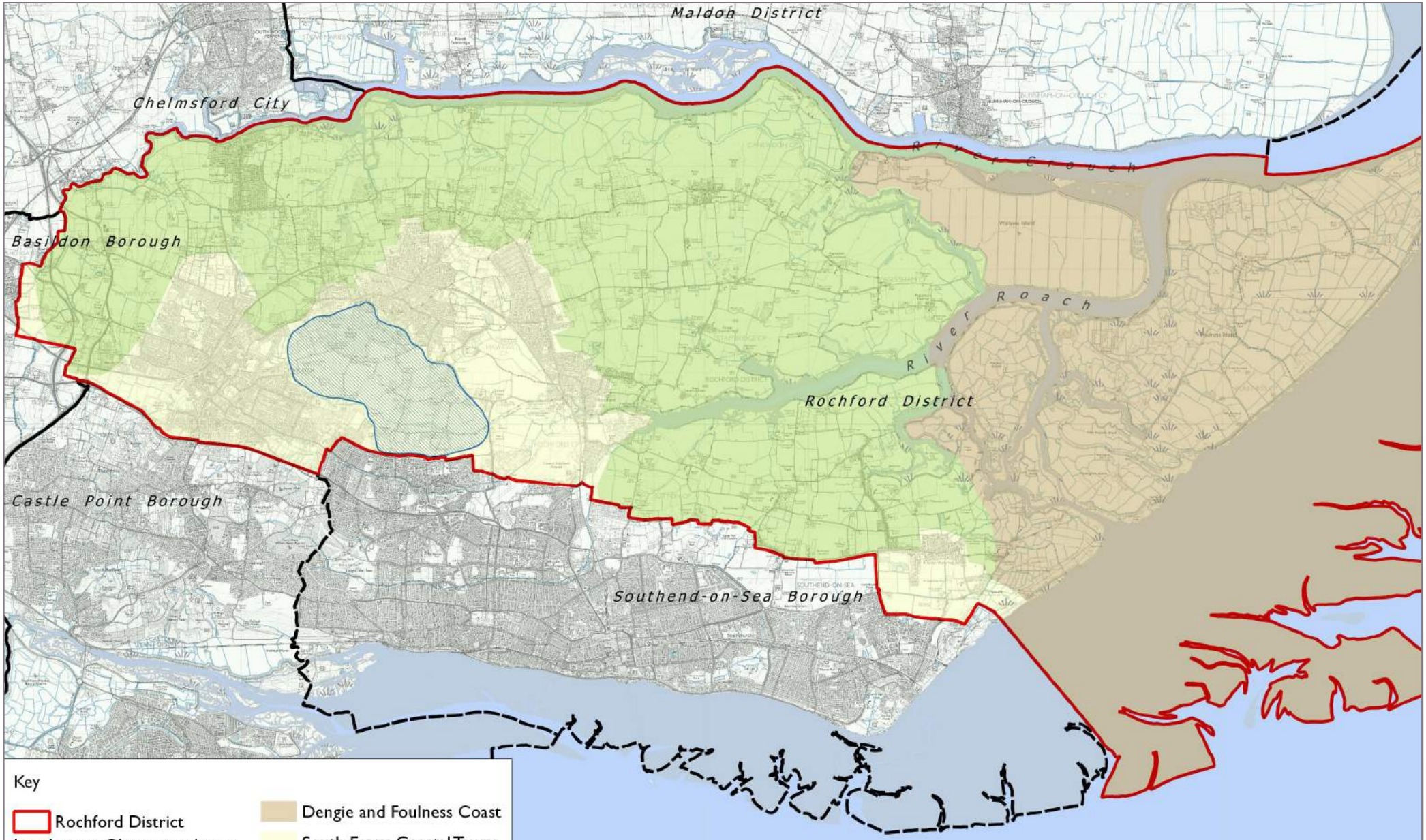
NPA on behalf of enfusion

		CLIENT:	Rochford District Council	FIGURE NO:	06b
DATE:	January 2015	PROJECT:	Rochford District Environmental Capacity Study	TITLE:	Locally designated biodiversity and rare & protected species
ISSUE STATUS:	**FINAL**				



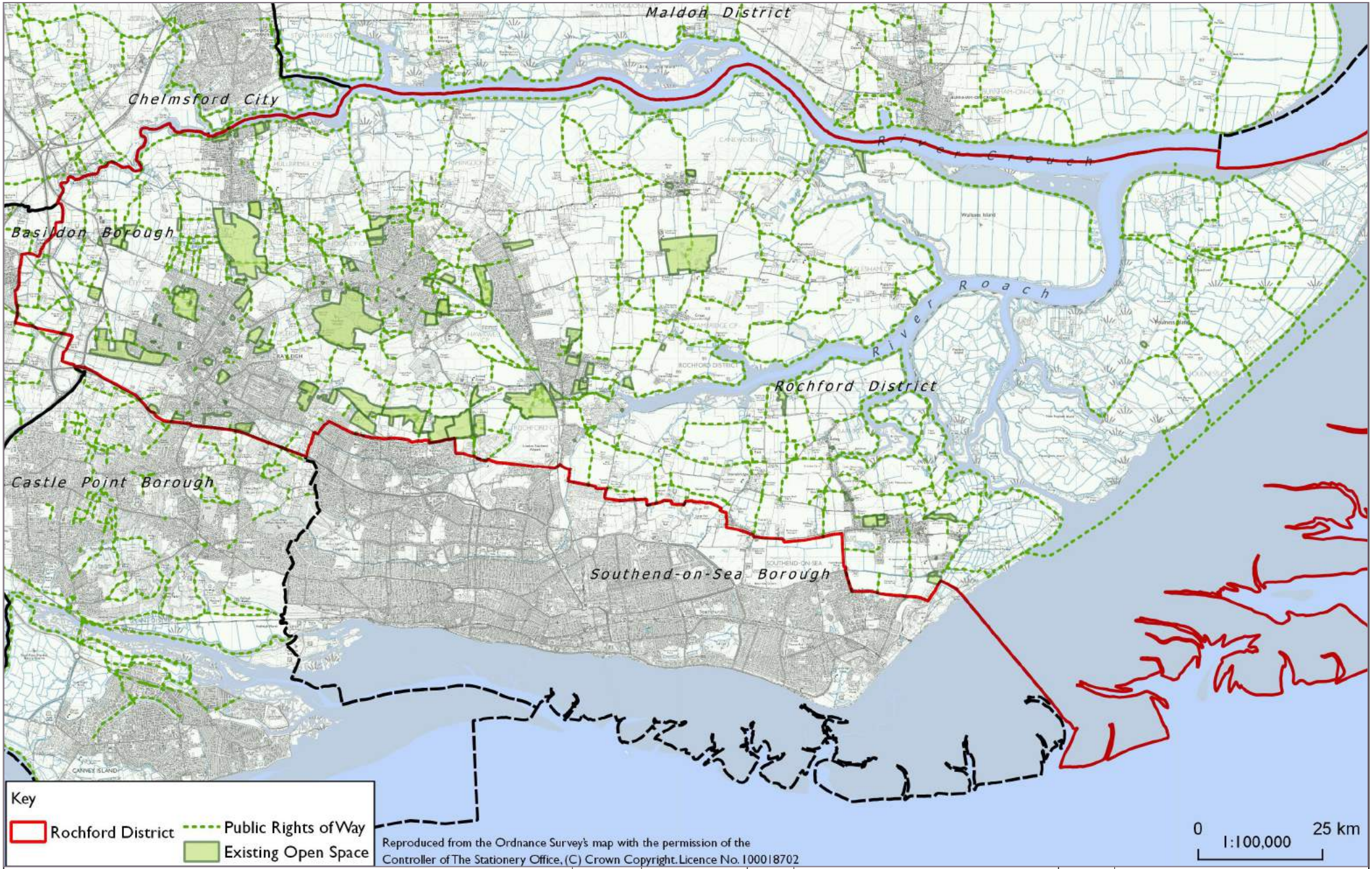
NPA on behalf of enfusion

DATE:	January 2015	CLIENT:	Rochford District Council
ISSUE STATUS:	FINAL	PROJECT:	Rochford District Environmental Capacity Study
FIGURE NO:	06c	TITLE:	Biodiversity Character Areas



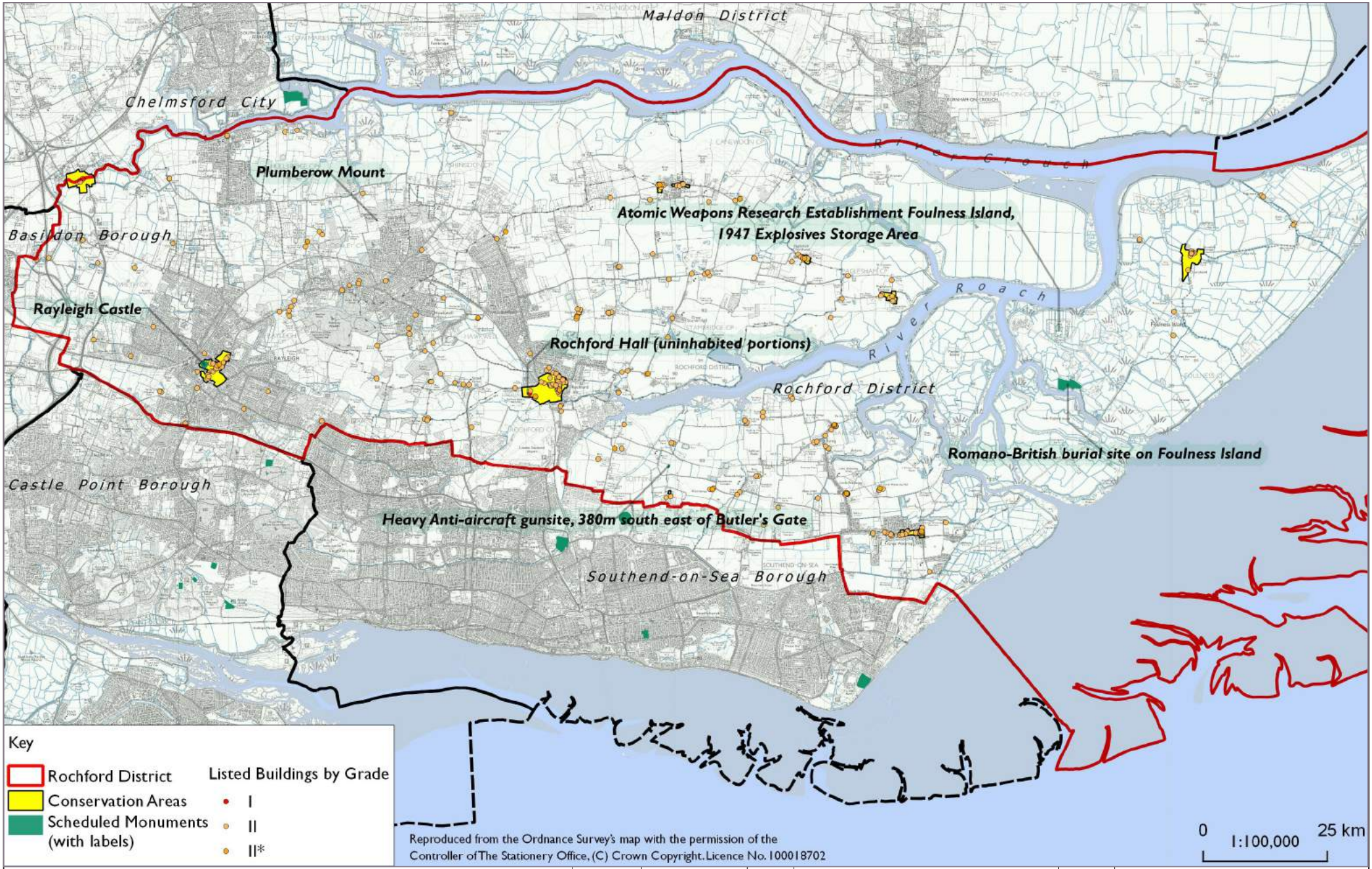
NPA on behalf of enfusion

		CLIENT:	Rochford District Council	FIGURE NO:	07
DATE:	January 2015	PROJECT:	Rochford District Environmental Capacity Study	TITLE:	Landscape & Visual Amenity
ISSUE STATUS:	**FINAL**				



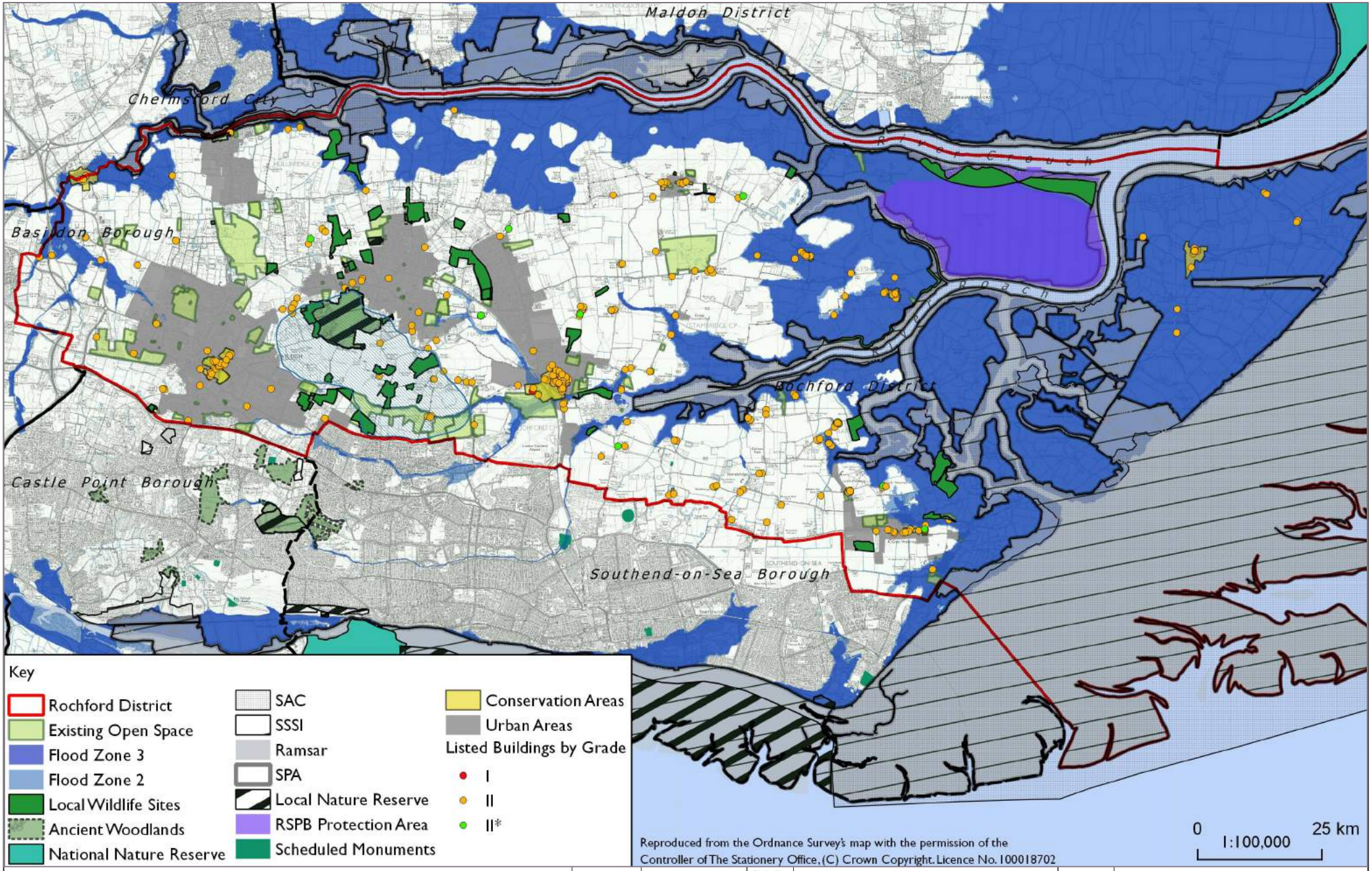
NPA on behalf of enfusion

DATE:	January 2015	CLIENT:	Rochford District Council
ISSUE STATUS:	**FINAL**	PROJECT:	Rochford District Environmental Capacity Study
FIGURE NO:	08		
TITLE:	Recreation & Amenity		



NPA on behalf of enfusion

DATE:	January 2015	CLIENT:	Rochford District Council	FIGURE NO:	09
ISSUE STATUS:	FINAL	PROJECT:	Rochford District Environmental Capacity Study	TITLE:	Cultural Heritage



NPA on behalf of enfusion

		CLIENT:	Rochford District Council	FIGURE NO:	10
DATE:	January 2015	PROJECT:	Rochford District Environmental Capacity Study	TITLE:	Key Environmental Constraints
ISSUE STATUS:	**FINAL**				