Essex Green Infrastructure Strategy

Appendices Part B

A strategy that champions for high quality green space and green infrastructure in Essex

2020

Building with Nature
EXCELLENT

Essex County Council

Contents

Appendix B1 - Glossary

Term	Definition
Accessible Natural Greenspace Standard (ANGSt)	Tool developed by Natural England based on the minimum distances people would travel to green spaces.
AONB	Area of Outstanding Natural Beauty - an area of countryside considered to have nationally significant landscape value.
Ancient Woodlands and Ancient Semi Natural Woodlands	Ancient woodland is a woodland that has existed continuously since 1600, There are two types of ancient woodlands - Ancient Semi Natural Woodland are woods that have developed naturally with native tree species (not plantations) and Plantations on ancient woodland sites that were felled and planted with non-native trees.
Biodiversity	The total variety of all living things. This includes all plants and animals, as well as the places and spaces in which they live.
Biodiversity Offsetting	Conservation activities that are designed to give biodiversity gain to compensate for residual losses.
Blue infrastructure	Known as water infrastructure, is a network of water assets such as rivers, canals, ponds and ditches. Blue infrastructure is concerned with use, quantity and quality of water and other water-related issues including flood risk.
CIEEM	The Chartered Institute of Ecology and Environmental Management promotes the highest standards of practice for the benefit of nature and society.
Climate Change	Climate change is a large-scale, long-term shift in the planet's weather patterns and average temperatures. Climate change in Intergovernmental Panel on Climate Change (IPCC) usage refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity.
Common Agriculture Policy	CAP is a system of subsidies and support programmes for agriculture operated by the European Union.
Community Forestry	Community forestry is a set of practices, techniques and methods to manage the forest and its natural resources. It is regulated by a specific legal framework that organises local communities' participation.
CIRIA	Construction Industry Research and Information Association aims to improve the performance, quality, efficiency and safety of the built environment through collaborative working.
Designated Sites	Nature sites and areas of countryside can be 'designated', which means they have special status as protected areas because of their natural and cultural importance.
Eco SERV - GIS	A Geographic Information System (GIS) toolkit for mapping ecosystem services at a county or regional scale. It uses input GIS/map data to generate fine-scale maps that illustrate human need or demand for ecosystem services as well as the capacity of the natural environment to provide them. (http://ecosystemsknowledge.net/ecoserv-gis)

Term	Definition
Ecosystem	A dynamic Sself-sustaining community comprised of interdependent organisms (plants, insects, and animals), their natural environment and their non-living environment interacting as a functional unit. It's all the living things in an area and the way they affect each other and the environment. It provides the food chain through which energy flows, and the biological cycles that recycle essential nutrients and wastes.
Ecosystem Services	Ecosystem services are the benefits provided by ecosystems in the form of goods and services that underpins our economy by producing value for people. These goods/services are classified along four functional categories: • Cultural services - the non-material benefits such as recreation, aesthetic and spiritual enrichment • Provisioning services – products obtained such as fresh water, food, energy, timber and wood fuel. • Supporting services – such as wildlife, nutrient cycle, water cycle, photosynthesis • Regulating services – protection from hazards such as the regulation of air quality, climate, flooding and erosion; water purification; disease and pest control and pollination.
Environment Therapies	Ecotherapy, also known as nature therapy or green therapy, provides individuals with an opportunity to explore their relationship with nature as a form to treat health and wellbeing issues.
Essex Natural Capital Asset Check	To support Essex County Council's 2014 -2018 environmental commissioning strategy a natural capital asset check (ENCAC) was commissioned from the Essex Place Services consultancy unit to provide a baseline of environmental resources and identify opportunities for their enhancement. Using the Eco SERV-GIS toolkit the natural capital asset check undertaken by Place Services aimed to identify and model ecosystem benefits at a county level.
Forest School	Forest School offers children and young people opportunities to achieve and develop their confidence and self-esteem through hands on learning experiences (usually) in a local woodland environment.
Green Belt	A policy and land use designation used in land use planning to retain areas of largely undeveloped or agricultural land surrounding or neighbouring urban areas. The main aim of Green Belt policy is to prevent urban sprawl by maintaining land permanently open.
Green Corridors	Green corridors can include railway embankments, river banks, heritage and cultural assets and roadside grass verges. Green corridors are linear routes offering recreational and travel opportunities, whilst facilitating wildlife migration.
Green roof & walls	A green roof or wall (also known as a living roof or wall) is where vegetation is intentionally grown and/or habitats for wildlife are established. Green roofs and walls provide different types of biodiversity habitats, water storage capacity, flood alleviation and energy saving potential.

Term	Definition
Green Spaces	Green Spaces are any vegetated areas of land and or water within or adjoining an urban area. Green Infrastructure is the network of different types of green spaces and assets.
Greenways	(Public Rights of Way, footpaths, cycleways and tracks, byways, bridleways), protected lanes, ancient roads, tracks and footpaths, all of which provide an invaluable resource for walking, riding and cycling.
GIS	Geographic Information System is a framework for gathering, managing, and analysing data. Rooted in the science of geography, GIS integrates many types of data. It analyses spatial location and organises layers of information into visualisations using maps
Grey Infrastructure	Traditional utilities infrastructure, e.g. roads, rail, sewers, pipes, etc.
Health Impact Assessment	HIA has the potential to be a useful tool to assess and address the impacts of development proposals. 'HIA is a means of assessing the health impacts of policies, plans and projects in diverse economic sectors using quantitative, qualitative and participatory techniques.' World Health Organisation - http://www.who.int/hia/en/
Infrastructure	The term 'infrastructure' means the basic facilities, services and installations needed for a functioning community, including transport, waste management, water supply, wastewater, flood risk, energy (including heat), health, community and cultural infrastructure and other local facilities.
IEMA	Institute of Environmental Management & Assessment is an international membership organisation, committed to global sustainability.
Lawton Principles	To make our network of sites bigger, better, and more joined up. This means: • Protecting what we have while improving its quality with better management; • Increasing the size of wildlife sites; • Enhancing connection by creating new wildlife corridors or stepping stones; • Creating new sites; • Reducing pressure on wildlife by improving the wider environment including through buffering wildlife sites
Local Plans	• A plan prepared by a local planning authority which sets the rules for how the local area will develop over time. The Local Plan, along with any Neighbourhood Plans, forms the overall development plan for the local area. Planning decisions must normally be taken in accordance with the development plan.
Local Wildlife Sites	• Local Wildlife Sites are areas of land that are locally important for their wildlife.

Term	Definition
Lower Layer Super Output Area	Layer Super Output Areas are a geographic hierarchy designed to improve the reporting of small area statistics in England and Wales.
National Nature Reserve	NNR are areas of land set aside for nature, to promote their conservation and enjoyment.
Natura 2000 sites	A network of nature protection areas in the territory of the European Union. It is made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive. The network includes both terrestrial and Marine Protected Areas.
Natural Capital	It is our 'stock' of waters, land, air, species, minerals and oceans. It underpins our economy by producing value for people in the form of goods and services often called ecosystem services. These goods/services include clean air & water, food, energy, wildlife, recreation and protection from hazards and is the foundation on which our economy, society and prosperity is built.
Natural & Semi-Natural Open Spaces	This type of open space includes woodlands (e.g. broadleaved, mixed, coniferous, ancient), urban forestry, scrubland, grasslands (e.g. commons, meadows), heathland, wetlands, nature reserves and wastelands (e.g. abandoned and derelict land and disused quarry) with a primary purpose of wildlife conservation and bio-diversity within settlement boundaries. Land, water and geological features which have been naturally colonised by plants and animals and which are accessible on foot to large numbers of residents.
Neighbourhood Plans	Neighbourhood plans are prepared by a Parish Council or Neighbourhood Forum for a neighbourhood area to establish general planning policies for the development and use of land in a neighbourhood. A way for communities to decide the future of the places where they live and work.
Open Spaces	Open Spaces is any open piece of land that is underdeveloped (has no built structures) and is accessible to the public and can include: green space, playground, public seating area, school grounds.
Particulate matter	Particulate matter is the sum of all solid and liquid particles suspended in air many of which are hazardous. This complex mixture includes both organic and inorganic particles, such as dust, pollen, soot, smoke, and liquid droplets.
Productive Spaces	Agricultural land and meadows – Spaces and land producing goods and services.
Public Rights of Way (PRoW)	All rights of way are legally highways, and anyone may use them at any time. There are different types, such as paths, byways and bridleways. The permanence of a PRoW is guided by the principle "once a highway, always a highway", so it remains a highway until there is a legal event to close, divert or extinguish it as a PRoW. A PRoW can be established in one of three ways: • Express dedication - where the landowner has given the public a right of use over their land; • Presumed dedication - where the public have used a right of way for a longer time than anyone can remember; or • Deemed dedication - where a right of way has been in use for 20 years or more.

Term	Definition
Ramsar sites	Ramsar sites are wetlands of international importance designated under the Ramsar Convention.
Self-sustaining	The ability for the green infrastructure to maintain and continue in a health state independently, without (or very little) outside assistance – through a source of revenue and maintenance cycle.
Sites of Special Scientific Interest	SSSIs are those areas of land and water that are considered to best represent the natural heritage in terms of their: flora – i.e. plants; fauna – i.e. animals; geology – i.e. rocks; geomorphology – i.e. landforms etc.
Special Area of Conservations	Special Areas of Conservation (SACs) are established under the European Union Habitats Directive (92/43/EEC).
Special Protection Areas	Sites designated under the European Union's Birds Directive (2009/147/EC). 1 The aim of Special Protection Areas (SPA) is to safeguard the European bird species considered to be of particular importance and therefore listed in Annex I of the Birds Directive, as well as regularly occurring migratory bird species which are not necessarily listed in Annex I.
Special Roadside Verges	Special Roadside Verges (otherwise known as Roadside Nature Reserves) are often remnants of old hay meadows and are recognised for their floristic diversity.
Sustainable Drainage (SuDS)	A sequence of water management practices and facilities designed to drain surface water in a manner that will provide a more sustainable approach than the conventional practice of routing run-off through a pipe to a watercourse.
Supplementary Planning Documents (SPDs)	Provide additional information on planning policies in a development plan.
Thames Terrace invertebrates	Flagship species of a distinctive community of spiders, bees and wasps, beetles, bugs and flies, such as, Shrill Carder Bee, Brown-banded Carder Bee and Red-tailed Carder Bee. Many of these species can also be found living in places such as quarries, gravel pits, waste ground and fly-ash lagoons, but these are often very temporary habitats under constant threat of development.
Sustainable development	Sustainable development means encouraging economic growth while protecting the environment and improving people's quality of life - all without affecting the ability of future generations to do the same.
UK Habitat Classification	The UK Habitat Classification is a new, free-to-use, unified and comprehensive approach to classifying habitats that is fully compatible with existing classifications.
Urban Greening	Urban greening refers to public landscaping and urban forestry that create mutually beneficial relationships between people and their environments. Urban greening refers to all forms of vegetation such as street trees, open parks and gardens, shrubs, green walls, green roofs, lawn and pervious soils.
Volatile organic compounds (VOCs)	VOCs are compounds that easily become vapours or gases. VOCs are released from burning fuel such as gasoline, wood, coal, or natural gas

Appendix B2 - Map of the Agricultural Land Classification and Countryside Stewardship Schemes

The green infrastructure asset map does not include productive spaces (such as meadows and the agricultural land in Essex) due to the scale of coverage. The map in figure 1 demonstrate that the agricultural land and farming makes up 68% of the land use in Essex. Credit 3: School of Environmental Sciences, University of East Anglia (2018).

It is important to be aware that not all green spaces or environmental features necessarily qualify to be part of green infrastructure. In rural areas, intensively managed agricultural lands would not normally form part of a green infrastructure network unless it were specifically managed in a way that supports local biodiversity or that encourages a more multifunctional land use which combines food production with other benefits, like recreation or water purification, which is often the case for agricultural land graded 4 to 5. In this instance where graded agricultural land has been identified as another green infrastructure typology such as a nature reserve or woodlands then they have been separated out from the agricultural land classification and included within the relevant green infrastructure typology. Although agricultural lands and their practices can play a significant role in maintaining the natural heritage in rural communities and are aesthetically pleasing, it is often the case these lands are inaccessible. This is not to say nothing cannot be done, however many farmers are engaged in environmental and countryside stewardship activities and already adopt management practices that include green infrastructure features and contribute to the wider green infrastructure network in the County as shown in figure 2.

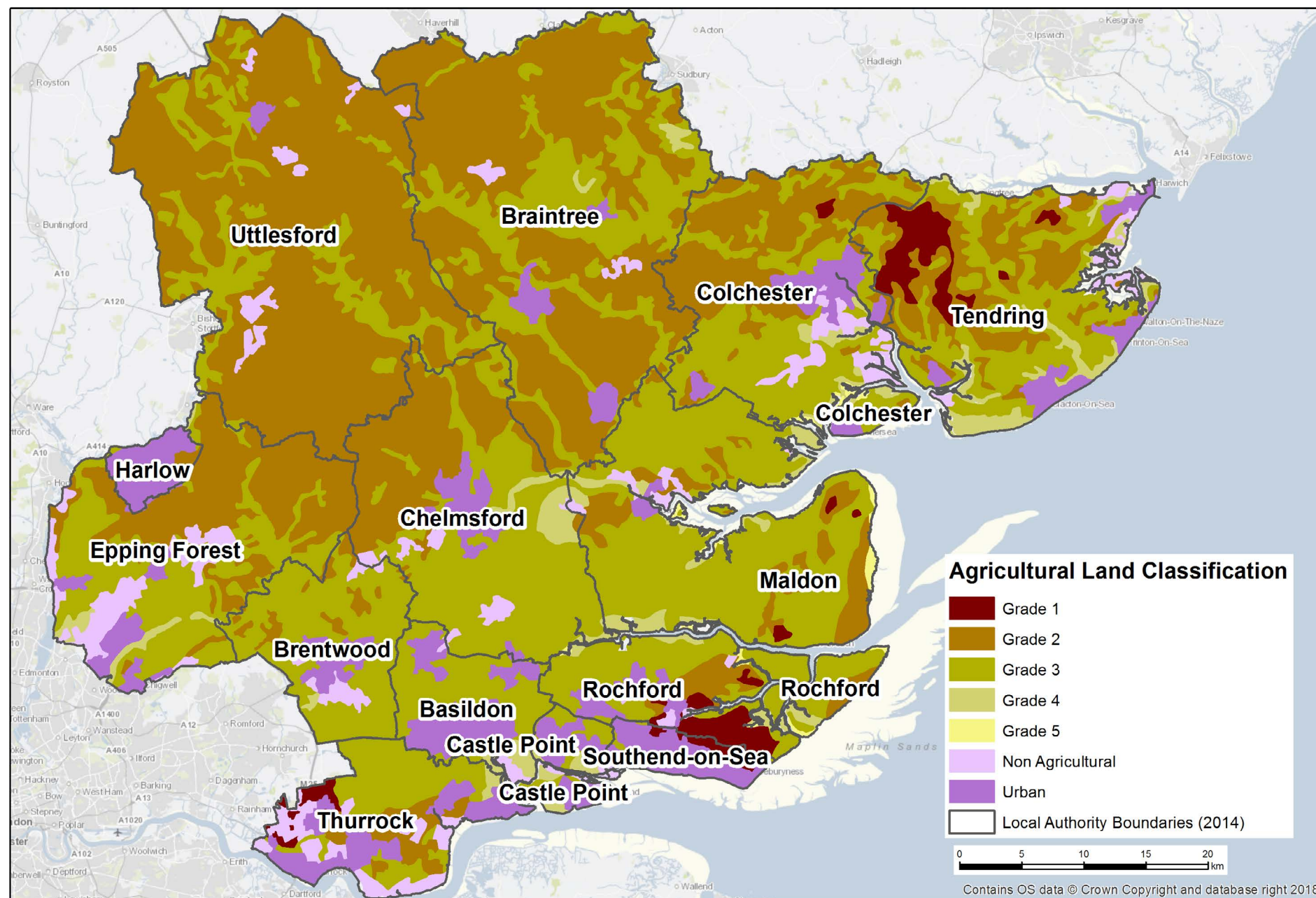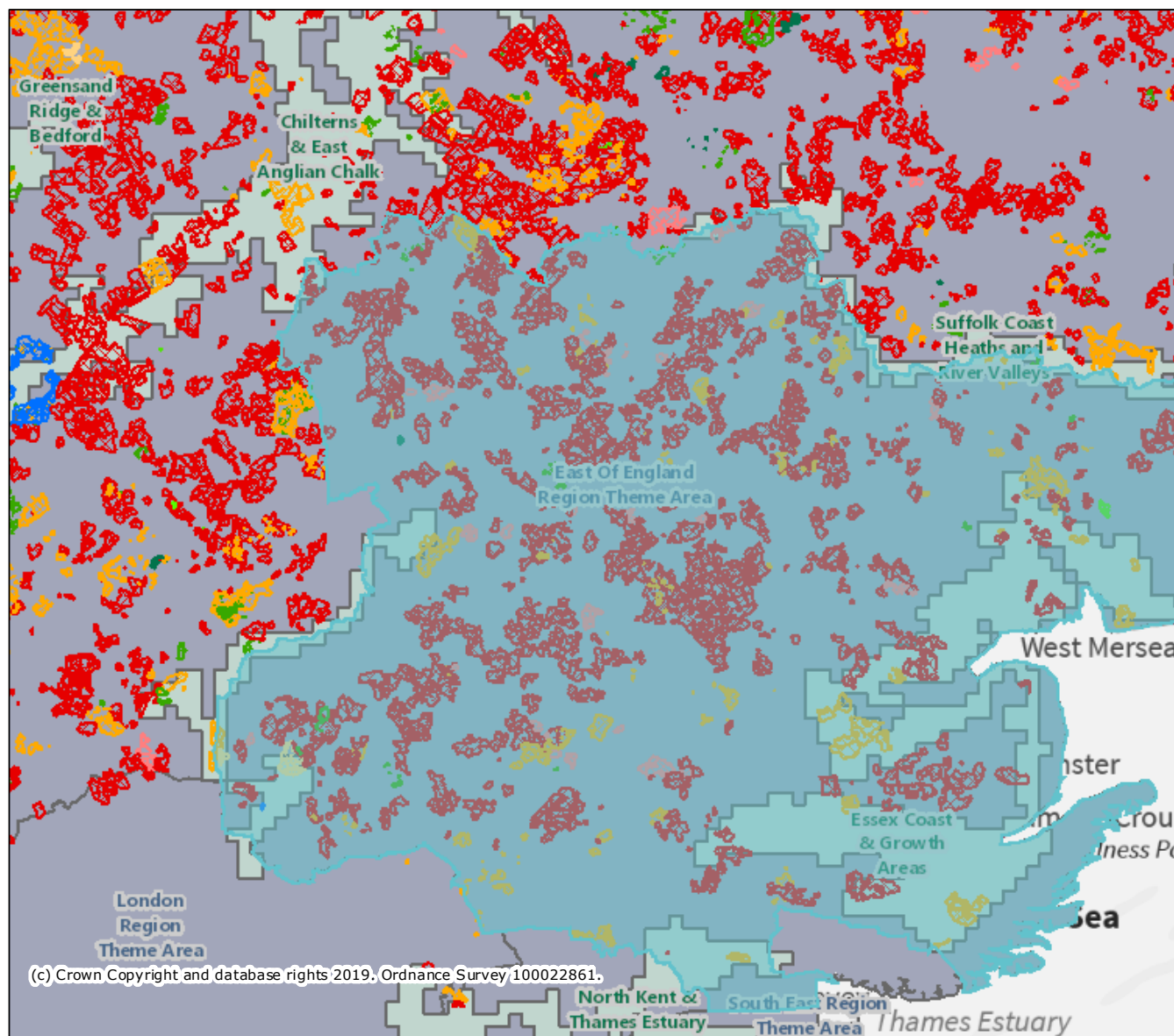Figure 1: Map of the graded agricultural land

Agricultural Land Classification

- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Non Agricultural
- Urban
- Local Authority Boundaries (2014)

Contains OS data © Crown Copyright and database right 2018

Magic Map

Legend

Countryside Stewardship Agreement Management Areas (England)

- Countryside Stewardship (Middle Tier)
- Countryside Stewardship (Higher Tier)
- Countryside Stewardship - Arable Offer (Middle Tier)
- Feasability Study and Historic Building Restoration
- Hedgerows and boundaries
- Implementation plan
- Woodland Creation Grant
- Tree Health Improvement
- Tree Health Restoration
- Woodland Management Plan
- Higher Level Stewardship Target Areas (England)
- Higher Level Stewardship Themes (England)

Projection = OSGB36
xmin = 482600
ymin = 181200
xmax = 653200
ymax = 260200

0   9   18
km
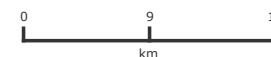
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Appendix B3 - Environmental Character of Greater Essex

Landscape

Greater Essex has a rich and varied landscape of expansive plateaus and wooded hills. The countryside rural in character that has been shaped by a long history of settlement and farming. Over 68% of the county is graded agricultural land not included as part of green infrastructure. Agriculture is the major land use in Essex and has considerable influence on landscape character and natural habitats. The grading classification of agricultural land is shown in the map in Appendix 2. The county retains many historic landscape features and has one of the longest coastlines in the country, much of which is of international significance for wildlife. The Greater Essex coast is extremely diverse in nature, varying from a largely open rural landscape with numerous historic and archaeological features, to the more heavily built up environment which exists around Harwich Port and Clacton. It is also highly valued water and land-based resource providing opportunities for recreation, tourism, agriculture, shellfisheries and many other forms of employment. It is broadly an open maritime landscape of marshes, creeks and eroding cliffs. Table 1 shows the broad habitats that make up the landscape and land use of Essex.

There are 4 Natural England's National Character Areas in Essex, each of which is distinctive with a unique 'sense of place'. These broad divisions of landscape form the basic units of cohesive countryside character, on which strategies for both ecological and landscape issues can be based along with each local authority own local level Landscape Character Assessment . The Essex National Character Areas are:

- Greater Thames Estuary
- Area of Outstanding Natural Beauty (AONB) to be designated – Suffolk Coast and Heath includes part of Essex
- South Suffolk and North Essex Clayland
- Northern Thames Basin.

Table 1: Land use and landscape (Place Services, 2017)

Broad Habitat (Grasslands merged)	Area (km²)	% cover of ECC admin area A
Arable and Horticulture	2,103	59
Broad leaved, mixed and yew woodland	237	6.4
Built up areas and gardens	335	9.4
Coniferous woodland	9	0.3
Heathland	0	0.0
Fen marsh and swamp	0	0.0
Open Freshwater	29	0.8
Improved grassland	662	17.9
Inland Rock	7	0.2
Littoral Rock	1	0.0
Littoral Sediment	93	6.0
Salt water	17	0.5
Supra-littoral sediment	0	0.0
Grassland with conservation value	74	2.0

Natural Environment

Greater Essex hosts a variety of important lowland habitats, such as the saltmarshes, mudflats and grazing marshes of the coast, which is recognised as one of the most important for wildlife in the UK. 13.4% (496km2) of Greater Essex receives some level of protection through national and international designations (such as, Special Areas of Conservation, Special Protection Areas [SPA], Ramsar and Sites of Special Scientific Interest [SSSIs]) mainly due to the large numbers of wildfowl and wading birds that visit the coast and estuaries in winter.

Whilst inland there are other internationally important habitat sites including the wood-pastures that are 'present or found' (either) within the ancient woodlands of Epping and Hatfield Forest and Hockley woods; and the wetlands of Abberton Reservoir and the Lee Valley.

There are 1,978 designations, which include:

- 2 Areas of Outstanding Natural Beauty
- 12 Special Protection Areas
- 86 sites of Special Scientific Interest
- 11 Ramsar sites
- 3 Special Areas of Conservation
- 7 National Nature Reserves
- 1,707 Local Wildlife Sites
- 1 Community Forest
- 49 Local Nature Reserves
- 100 Special Roadside Verges

Several of the SSSIs are mainly associated with the large coastal estuaries of the Crouch, Blackwater, Colne, Stour, Roach and Orwell. There are numerous other areas of habitats across Greater Essex, such as the invertebrate habitats of the Thames Terraces and further woodland types include the river valley cricket bat willow plantations, the occasional conifer plantation and new broadleaf plantations. Scatted amongst the arable farmland and sometimes extending into urban areas, are rivers, woodlands, and brownfields that provide important places for wildlife. Greater Essex also has over 100 sites across the county that have been designated as Special Roadside Verges that provide an invaluable habitat for wild flowers and other native species. The Essex Biodiversity Action Plan 2010-2020 identified 19 priority habitats for their long-term management.

Trees and Ancient Woodlands

Trees, woodlands and hedges are a significant feature of the Greater Essex countryside that improves the quality of life for residents through their contribution to the natural beauty, biodiversity and economy of the County in addition to providing a recreation resource and a natural cooling system for towns. Greater Essex has many ancient and veteran trees which are of huge value for biodiversity, supporting many species, in addition to their cultural and social significance.

The Forestry Commission's Inventory of Trees and Woodlands (2002) estimates the woodland cover of Greater Essex is 5.3% (195km^2) of total land area, of which 3.5 % (128km^2) is defined as ancient woodlands over 2 hectares in size. Of these 73km^2 is Ancient Semi Natural Woodlands (ASNW), which are woods that have been continuously wooded since at least 1600AD. It is believed that the total for ancient woodlands and ASNW is an underestimate as the majority of woodlands under 2 ha in size, totalling about 40km2(1.1%) of the total land area may not have appeared on the Ancient Woodland Inventory because they were not registered as woodlands on the historic maps used in the study, due to their low tree density. All ASNW are identified as Local Wildlife Sites and only a small proportion of ancient woodlands have any statutory protection by SSSI (approximately 15%) or Tree Preservation Order.

Based on the National Tree Map data there are over 5 million trees in Essex (BlueSky, 2017), but the Forestry Commission inventory estimates that there are just over 1.5 million trees outside woodland in rural Essex.

It is anticipated that there are a similar number of individual trees within urban Essex. The amount of hedgerow in Essex is estimated to average about 36m per hectare (total of 12,500 km).

Historic Environment

The variety in the geology and soils, as well as the rich and complex historic environment has played an important role in shaping the landscape, wildlife and economy of the County. The historic environment has a positive physical presence and powerful influence on peoples' sense of identity, their well-being, and quality of life. It has developed through a history of human activity spanning over 450,000 years with some of the resource lying hidden beneath the ground in the form of archaeological deposits. Other elements, such as the area's historic landscape; the pattern of fields, hedges, grazing marsh, woodlands, farms woods and tracks, which are of ancient origin, are a highly visible record of past human activity. The 'built' part of the historic environment is equally rich, with the character of towns, villages, hamlets, farms, roads and ports having been shaped by their historic buildings.

Essex has a significant number of ports and landing places, along with its proximity to London and to the coast has meant that for many centuries transport, trading-links and communications routes across the county have been of great importance. The basic layout of modern Essex in terms of principal roads such as the A12 that runs from London to Ipswich, via Chelmsford and Colchester and its towns is Roman in origin; Colchester is the oldest recorded town in Britain.

Green Spaces

There is a wide and varied amount of green space in Greater Essex (as shown in figures 2 and 3 of the strategy) that represents a green infrastructure network of green, blue and sometimes brown components that lie within and between towns and villages and can cross Local Authority areas. Green Spaces are any vegetated areas of land or water within or adjoining an urban area. It is comprising of country parks, village greens, woodlands, cemeteries, churchyards, playing fields, reservoirs, private airfields, urban and historic parks, common lands, floodplains, river valleys, cycleways, outdoor recreation facilities, nature reserves and beaches.

Essex County Council manages seven of its own country parks and over 25 woodlands. It also plays an active role in the Thames Chase Community Forest, Lee Valley Regional Park, and Dedham Vale Area of Outstanding Natural Beauty and works in partnership with the Woodland Trust at Hainault Forest. There are also country parks and nature reserves in most districts, owned and managed by the local authority or conservation charities such as the Essex Wildlife Trust, RSPB, National Trust, the Land Trust and Woodland Trust. Hadleigh Country Park is home to the Olympic 2012 mountain bike track, which is has been adapted to suit all abilities and ages, as well as offering other multi-functional benefits.

Water

Essex has several river catchments, the Stour, Blackwater, Lee, Chelmer (of which are also navigable rivers and canals) and Colne; and coastal streams of the Crouch, Roach and Dengie. These are complicated and vulnerable catchments because of the low-lying land and coastal squeeze issues, combined with the development needs and protection of SSSI's and Ramsar sites. The southern catchments tend to flow into the Thames, and the northern to the east coast estuaries and the North Sea.

In the floodplains of the principal estuaries are extensive expanses of alluvial marshland, such as Dengie, Canvey, Tilbury and the Valleys of the Rivers Crouch, Roach and Mardyke, which are increasingly managed for nature conservation and contain large wetland areas. The Valleys of the Rivers Crouch and Mardyke are also surrounded with clay uplands., The Lee Valley Regional Park provides a hub for waterborne recreation and was the base for the 2012 Olympic event for white water canoeing.

Essex also has significant reservoirs, which serve millions of households: Ardleigh, Abberton, and Hanningfield, and that also provide habitats for wetland wildlife, which are successfully managed by the Essex Wildlife Trust for conservation offering multi-functional of use. There are also agricultural reservoirs that have been developed across the eastern part of the county to supply water for crop irrigation and have the added benefit of commercial use such as providing fishing lakes. Essex has ten designated bathing water sites along Essex coast.

Public Rights of Way (PRoW)

The Public Rights of Way network in Essex comprises approximately 6,531km of footpaths (84%), bridleways (12%), restricted byways (0.01%) and byways (4%), which provide access to the countryside and links between green spaces, towns, villages and places of employment.

There are 8 long distance paths in Essex. All are individually marked, and several are promoted (although their level of promotion is varied) by Essex County Council. They are as shown in table 2:

A new long-distance trail (the England Coast Path) is being implemented by Natural England in Essex running the full 350 miles of the Essex coast. The first section of this path has been granted permission to be created from Burnham-on-Crouch to Maldon.

Table 2: Long distance paths - Essex (ldwa, 2018)

Path	Length (km²)	Length (m)
Forest Way	39.5	24.5
Flitch Way	25.4	15.8
Saffron Trail	112.5	69
The Essex Way	131.7	81.8
Roach Valley Way	37.4	23.2
Stour Valley Way	101	62.8
St Peters Way	66.1	41.1
Thames Estuary Path	44	26
Total	557.6	344.2

# Appendix B4 - Green Infrastructure Asset Data

Table 3: Types of green space (km²)

Local Authority	Parks and gardens	Natural and semi-natural open space	Ancient Woodlands	Coastal features	Greenways	Outdoor sports facilites	Amenity green spaces	Cemeteries and churchyards	Allotments, community gardens and city farms	Open space and premises	Reservoirs, lakes and ponds	Waterways	Total GI Classes	Authority Area	GI % as of authority
Basildon	3.6	15.2	0.4	5.3	0.5	3.9	0.1	0.3	0.1	12.7	0.1	0.0	42.2	110	38.4
Braintree	5.1	51.4	12.7	0.1	4.8	6.2	0.1	0.7	1.4	4.5	0.3	0.0	87.3	612	14.3
Brentwood	8.3	22.8	4.5	0.0	0.9	7.4	0.0	0.3	0.2	3.8	0.0	0.0	48.2	153	31.5
Castle Point	3.1	4.0	0.0	4.1	0.2	2.5	0.0	0.1	0.1	7.9	0.0	0.0	22.0	45	48.8
Chelmsford	8.6	31.9	8.2	0.8	2.9	5.9	0.1	0.4	1.2	6.5	3.6	0.0	70.1	342	20.5
Colchester	4.6	41.1	4.8	14.3	2.1	3.6	0.1	0.6	1.0	9.8	5	0.0	87.0	333	26.1
Epping	17.3	36.9	15.9	0.0	2.7	8.9	0.0	0.5	0.7	10.1	2.2	0.0	95.2	339	28.1
Harlow	2.3	2.8	0.0	0.0	0.1	1.8	0.0	0.2	0.2	6.6	0.0	0.0	14.0	31	45.9
Maldon	3.0	25.0	4.2	27.4	2.1	4.5	0.0	0.3	0.7	1.2	0.0	0.0	68.4	359	19.1
Rochford	1.3	12.3	1.7	24.5	1.2	2.7	0.0	0.2	0.3	1.9	0.5	0.0	46.6	169	27.5
Southend	1.5	1.0	0.0	0.4	0.0	3.0	0.0	0.4	0.3	4.9	0.1	0.0	11.6	42	27.8
Tendring	2.0	20.2	5.5	16.8	1.7	4.2	0.1	0.6	0.6	4.7	0.8	0.0	57.2	338	16.9
Thurrock	5.8	19.9	0.1	7.8	0.6	4.5	0.1	0.3	0.4	11.0	0.9	0.0	51.4	163	31.5
Uttlesford	10.5	42.8	14.8	0.0	6.2	2.9	0.1	0.5	0.8	0.1	0.2	0.0	78.9	641	12.3
Outside Local Authority Boundaries	0.04	0.18	0.01	0.2	0.01	0.01	0.0	0.0	0.0	0.02	0.0	0.1	0.3	0	70.3
Grand Total	77.1	327.8	72.9	101.5	26.2	62.0	0.7	5.5	8.1	85.9	13.9	0.1	781.7	3,689	21.3

Appendix B5 - The Essex Context

People and Projections
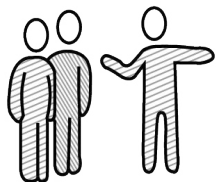
1,820,900 people live in Greater Essex (2017). The county's population is expected to increase to 2,133,100 by 2041. The greatest increases are currently projected in Colchester, Basildon and Chelmsford.

1,013,100 females and 891,900 males live in Greater Essex (2017).

13.3% of the population are from ethnic backgrounds.[a]

The number of households with dependent children in Essex in 2014 has been projected to increase from 174,000 to 213,000 in 2039 [b]

Development Growth

In 2016 there's approximately 784,000 households across Greater Essex local authorities.

179,657 homes are needed across Greater Essex by 2036.

137,663 homes are planned in Greater Essex to be developed by 2036.

Greater Essex has 103 Km of Motorways (64mi); 838 miles of A Road Highway (1,348km); 3,900 miles (6,300km) of Public Rights of Way (Byway 3.80%; Restricted Byway 0.01%; Bridleway 12.34%; Footpath 83.86%).

Walking and cycling infrastructure across Greater Essex varies with good provision in the larger settlements but fewer formal facilities in the smaller towns and villages. [c]

Economic Growth
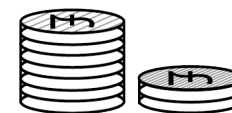
Greater Essex generates £36bn Gross Value Added (GVA) and supports over 816,000 jobs.

79,000 additional jobs are needed as forecasted by the East of England Forecasting model (2016 run). [c]

3.4% of Essex population aged 16+ are unemployed. [d]

12,616 people (or 2.3 per 1,000 population) of working age (16-64) were claiming Jobseekers Allowance (JSA) in April 2016, that is 1.2% of Greater Essex's working age population. Tendring (2.6%) and Harlow 2.2%) experience the highest level of JSA claimant rates. [c] & [d]

Key high performing economic and growth sectors include advanced manufacturing; low carbon and renewable energy; transportation and logistics; life sciences and healthcare; digital, cultural and creative industries; finance and business services; education; and wholesale and retail trade. [c]

Social and Health

In Essex, two-thirds (66.3%) of adults aged 16+ are either overweight or obese (2013-15). While 20.9% of children in reception and 31.8% of children in year 6 are obese. ([d]) The projected annual increase in obesity rate is 2% in adults and 0.5% in children.[b]

The mortality rate from causes considered preventable in Essex was 164.1 per 1,000 population in 2014-16, while the mortality rate in under 75's from is:[d]

Disease	Essex	Region
Cardiovascular	63.5 per 1,000	64.7 per 1,000
Respiratory	29.3 per 1,000	28.4 per 1,000

17.1% of residents have a disability or long-term health issues. [b*]

Some of the most deprived areas in England are within Essex: six in Tendring and two in Basildon. [b] 14.1% of children under 16 are in low income families, with 12% of r people are living in income deprived households in Greater Essex. [d]

Over 150,000 Essex residents are expected to be living with a mental health illness, with almost 50% of them having developed this condition in their early teens. In 2015/16 4.5% of people reported to have long term mental health problems. It is estimated that 8.7% of 5-16-year olds and 137,017 of 18-64-year olds to have a mental health disorder. [g] The prevalence of dementia, which increases rapidly with age, is projected to increase by 38% by 2021. [b]

In Essex in 2014, 57.9% of people had the recommended amount of physical activity (2.5hours a week). [b] Although fewer women take physical activity, at least 33.3% of females are active once a week compared to 38.3% of males. The Active Lives Survey (2017) highlighted that 65% of people are active, whilst 22.1% of people are inactive. The total cost of physical inactivity in Essex to the NHS is estimated to be £58,213,764 per year. [g]

Data Source: b: Joint Strategic Needs Assessment (2016) & Joint Health & Wellbeing Strategy for Essex(2017)

Data Source: b*: Census, 2011

Data Source: d:Public Health Outcomes Framework: Wider Determinants of Health Tool

Data Source: f: Essex Natural Capital Asset Check (2017)

Data Source: g: Sports & Physical Activity Profile: Greater Essex (2017)

Data Source: h: (Economic Impact of Tourism Essex 2015, Destination Research, 2015); i: Space for People (2017).
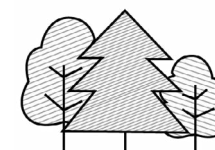
Environment

56.9% of Greater Essex is arable or horticulture

9.1% built up areas 6.7% Woodland [f]

In 2017 18% of the population in Essex live near accessible woodlands, while 36% inaccessible woodlands at least 2 ha in size are within 500 meters of where they live[i].In Greater Essex there are:

- 2 Areas of Outstanding Natural Beauty (AONBs):
- 86 Sites of Special Scientific Interest (SSSI)
- 12 Special Protection Areas
- 3 Special Areas of Conservation
- 11 Ramsar Sites
- 7 National Nature Reserves
- 1,707 Local Wildlife Sites
- 49 Local Nature Reserves
- 1 Community Forest
- 100 Special Roadside Verges
- 117km² of land managed/owned for conservation
- 40 registered parks and gardens of Special Historic Interest
- 3 of the best-preserved medieval forests in Britain (Hatfield, Epping and Writtle)
- 14,000 legally protected listed buildings and 320 Scheduled Monuments.

- 117km² of land managed/owned for conservation
- 40 registered parks and gardens of Special Historic Interest
- 3 of the best-preserved medieval forests in Britain (Hatfield, Epping and Writtle)
- 14,000 legally protected listed buildings and 320 Scheduled Monuments.
- 1,651km Main rivers
- 3 major reservoirs. [f]

Essex Wildlife Trust manage 87 nature reserves, 2 Nature Parks and manage 8,400 acres of land

RSPB manage 10 reserves

Between March 2015 and February 2016, 19.2% of people in Essex utilise the outdoor space for exercise/health reasons, compared to England's average of 17.9% and region's 18.7%.[d]

59% of primary pupils and 47% of secondary pupils walk to school. [g]

The total number of visitors in 2015 to Essex (day and staying trips) was 50,305,616 with an estimated total tourism value of £3,026,159,150. 1.3 million visitors per annum used the seven country parks, a visitor farm and a heritage site as well as 40 smaller open spaces and woodlands managed by Essex County Council. [h]

Climate change and flood risk

The annual concentration of human made fine particulate matter (air pollution) in Essex in 2016 was 9.6µg/M3 (adjusted to account for population exposure) compared to England's average of 9.3 µg/M3. [c]

Essex is one of the top 10 areas at risk of surface water flooding in UK. The number of houses in Greater Essex at risk from:

- Surface water is approx. 36,000
- Rivers is approx. 10,000
- Sea is approx. 50,000

Essex can generally expect more frequent extreme weather events (such as storms, extreme cold weather); milder and wetter winters; and hotter drier summers by 2080. [e]

The Essex coastal estuaries are important for UK biodiversity and these areas may be the most affected by coastal change. Coastal zones, semi natural grasslands, wetlands and freshwater habitats are particularly vulnerable to changes in water availability and species range shifts. Biodiversity is likely to face increasing pressure due to changes in soils and invasion of non-native species and diseases.

To maximise the capacity of our natural environment for Essex to cope with climate change, the green infrastructure network needs to be as robust and resilient as possible to current conditions and to mitigate the impacts of extreme weather events through its design solutions (e.g. shading and natural cooling).

Data Source: c: Greater Essex Growth Infrastructure Framework (2017)
Data Source: d:Public Health Outcomes Framework: Wider Determinants of Health Tool
Data Source: e: UK Climate Projections 2009
Data Source: f: Essex Natural Capital Asset Check (2017)
Data Source: g: Sports & Physical Activity Profile: Greater Essex (2017)
Data Source: h: (Economic Impact of Tourism Essex 2015, Destination Research, 2015); i: Space for People (2017).

Appendix B6 - Percentage of Green Infrastructure and Graded Agricultural Land in each Local Authority Area

The maps below show that the percentage of green infrastructure in each local authority area varies from 16% (in Tendring) to 42% (in Castle Point and Harlow). Higher values tend to occur in the south of Essex, partly reflecting the higher proportions of agricultural land in the north of the county.

The total percentage land area of green infrastructure is only one consideration to give an idea on the overall provision of green infrastructure in Essex, but it says nothing about the quality or local importance of the green infrastructure.

Figure 3: The percentage of green infrastructure and graded agricultural land for each local authority area
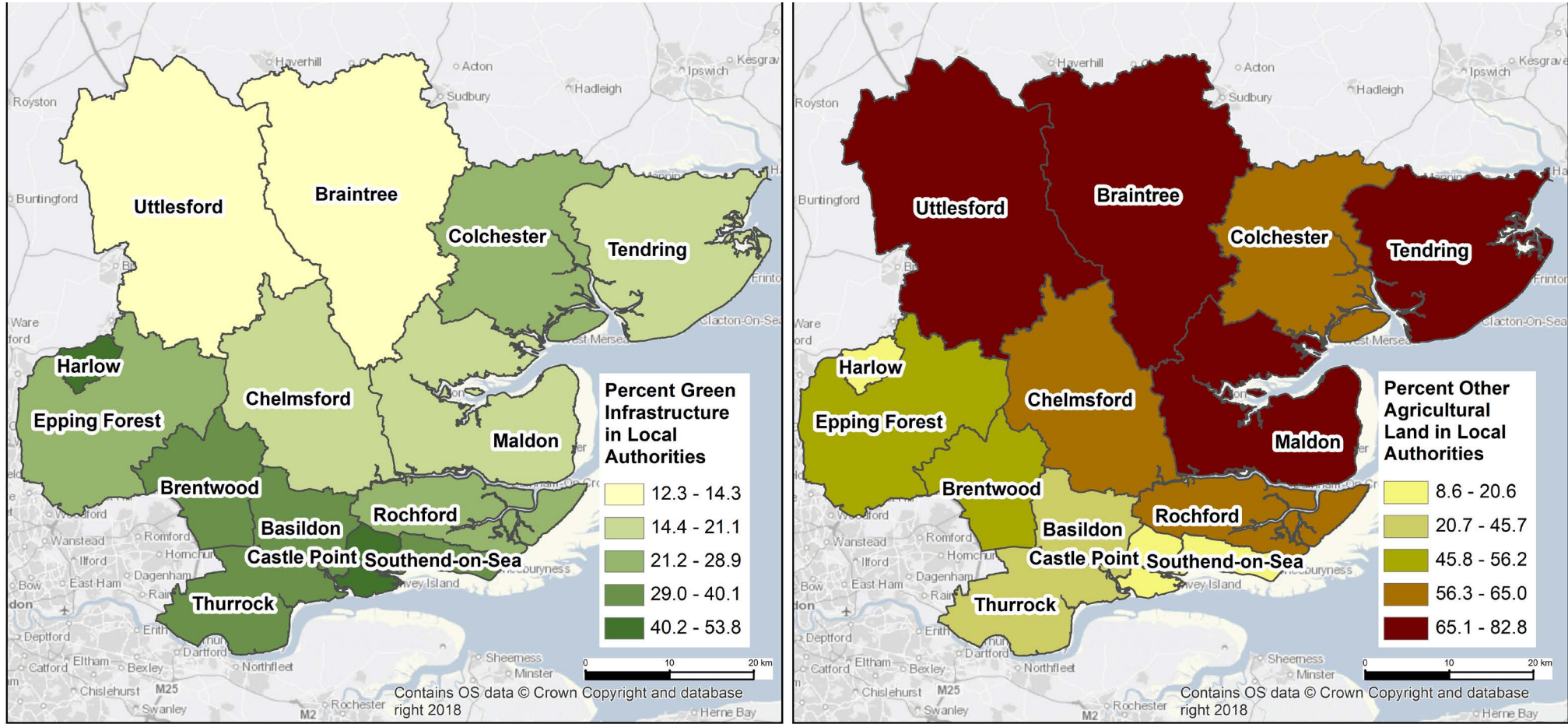
Appendix B7 - Green Infrastructure Asset GIS Analysis

Green Infrastructure Types (Assets)	Green Infrastructure Typology	Green Infrastructure Functions
• Urban park • Pocket park • Neighbourhood park • Community park • District park • Regional park • Country park • Garden • Vegetated garden • Un-vegetated garden	Parks and Gardens	• Recreation • Green travel route • Habitat Provision • Heritage and cultural asset • Pollution absorption and removal • Flood attenuation and water resource management • Cooling effect • Access to nature
• Woodland: ancient	Ancient Woodland	• Linked to Natural and semi-natural open spaces
• Grasslands • Heathland • Scrub • Woodland • Woodland; broadleaved • Woodland; mixed • Woodland; coniferous • Abandoned ruderal and derelict areas • Vacant/derelict land • Disused quarry • Wetlands	Natural and semi-natural green space	• Recreation • Habitat Provision • Heritage and cultural asset • Food production and productive landscapes • Pollution absorption and removal • Flood attenuation and water resource management • Cooling effect • Access to nature • Heritage and Cultural Assets
• Green access route • Riparian routes • Road island/verge • Railway corridor	Green Corridors	• Recreation • Habitat Provision • Pollution absorption and removal • Access to nature • Heritage and Cultural Assets

Green Infrastructure Types (Assets)	Green Infrastructure Typology	Green Infrastructure Functions
• Sports pitches • Natural sports pitches • Artificial sports pitches • Recreation ground • Ball courts • Natural ball court • Artificial ball court • Golf course • Race course • Bowling green • Equestrian centre • Other recreational	Outdoor sports facilities	• Recreation • Grassed areas - Flood attenuation and water resource • Cooling effect • If bounded by trees - Pollution absorption and removal • Habitat • Heritage or cultural assets • (These features were difficult to distinguish based on the OS data sources used to map the GI assets).
• Green roof • Extensive green roof • Intensive green roof • Brown roof • Green wall • Ground based green wall • Facade-bound green wall • Balcony green • Ground level planters • Flower bed • Introduced shrub • Tree • Mature tree • Young tree • Tree avenue/alley • Hedgerow • Bioswale • Rain garden	Public realm/civic spaces (No data available)	• Habitat Provision • Pollution absorption and removal • Flood attenuation and water resource management • Cooling effect • Access to nature

Green Infrastructure Types (Assets)	Green Infrastructure Typology	Green Infrastructure Functions
• Children's Play Space • Children's Play Space; natural • Children's Play Space; non-permeable • Outdoor gym • Natural outdoor gym • Non-permeable outdoor gym • Adventure playground • Natural adventure playground • Non-permeable adventure playground • Youth area • Village greens	Amenity green spaces	• Recreation • Heritage and cultural asset • Flood attenuation • Cooling effect
• Cemetary • Churchyard	Cemeteries and churchyards	• Habitat Provision • Heritage and cultural asset • Access to nature
• Educational premises open space • Natural educational sports pitches • Artificial educational sports pitches • Other educational open space • Municipal premises open space • Commercial premises open space • Housing estate open space	Open space around premises	• Recreation • Habitat Provision • Pollution absorption and removal • Access to nature
• Fresh water body • Natural lake or pond • Artificial lake or pond	Reservoirs, lakes and ponds	• Recreation • Habitat Provision • Food production and productive landscapes • Flood attenuation and water resource management • Access to nature
• Coastal • Beaches and sand dunes • Foreshore/rocks • Tidal water • Open saline water	Coastal features	• Recreation • Green travel route • Habitat Provision • Flood attenuation and water resource management • Coastal storm protection • Access to nature

Green Infrastructure Types (Assets)	Green Infrastructure Typology	Green Infrastructure Functions
• Watercourse • Natural watercourse • Artificial watercourse	Waterways	• Habitat Provision • Food production and productive landscapes • Pollution absorption and removal • Flood attenuation and water resource management • Heritage and cultural asset
• Walking/cycling route • Bridleway • Public Rights of Way • Byways • Bridleways	Greenways	• Recreation • Green travel route • Habitat Provision • Access to nature
• Small-scale food growing • Allotments • Orchard • City farm • Community garden	Allotments, community, gardens and city farms	• Recreation • Habitat Provision • Food production and productive landscapes • Pollution absorption and removal • Access to nature • Heritage and cultural asset

| Direct or indirect impacts on functions	Environment						Economy							Social					
Function	Climate Change adaptation and mitigation	Flood alleviation and water management	Environmental quality and aesthetics	Biodiversity	Heritage preservation	Quality of place	Land and property values	Economic growth and investment	Labour productivity	Tourism	Products from the land	Inward investment	Cost Savings	Health and well-being	Recreation and leisure	Sense of Place	Community Resilience	Education	Encourage Sustainable travel
Recreation	I		D		I	D	I	I	I	D		I	I	I	D	D	I	I	I
Green travel route	I		D	I		D	I	I	I	I	I	I	I	I	D	D	I		D
Habitat Provision	D	I	I	D	I	I	I	I	I	I	I	I	I	I	I	D	I	D	I
Heritage and cultural asset	I		I	I	D	D	I	I	I	D		I	I	I	D	D		D	
Food production and productive landscapes				I			I	D	I		D	I	I	I				I	
Pollution absorption and removal	D	D	D	I		D	I	I	I	I	I	I	D	I		D	D		I
Flood attenuation and water resource management	D	D	I	I		I	I	I	I	I	I	I	D	I		I	D		I
Coastal storm protection	D	D	I	I		I	I	I	I	I		I	I	I		I	D		
Cooling effect	D		I	I		I	I	I	I	I		I	I	I			D		
Access to nature			D	I		I	I	I	I	I		I		I	D		I	D	

Figure 4: Mapping by UEA showing the number of benefits performed by the green infrastructure typology and an insert of Harlow

Number of Benefits

- 5
- 7
- 9
- 11
- 12
- 13
- 14

Local Authority Boundaries (2014)

Harlow

Contains OS data © Crown Copyright and database right 2018
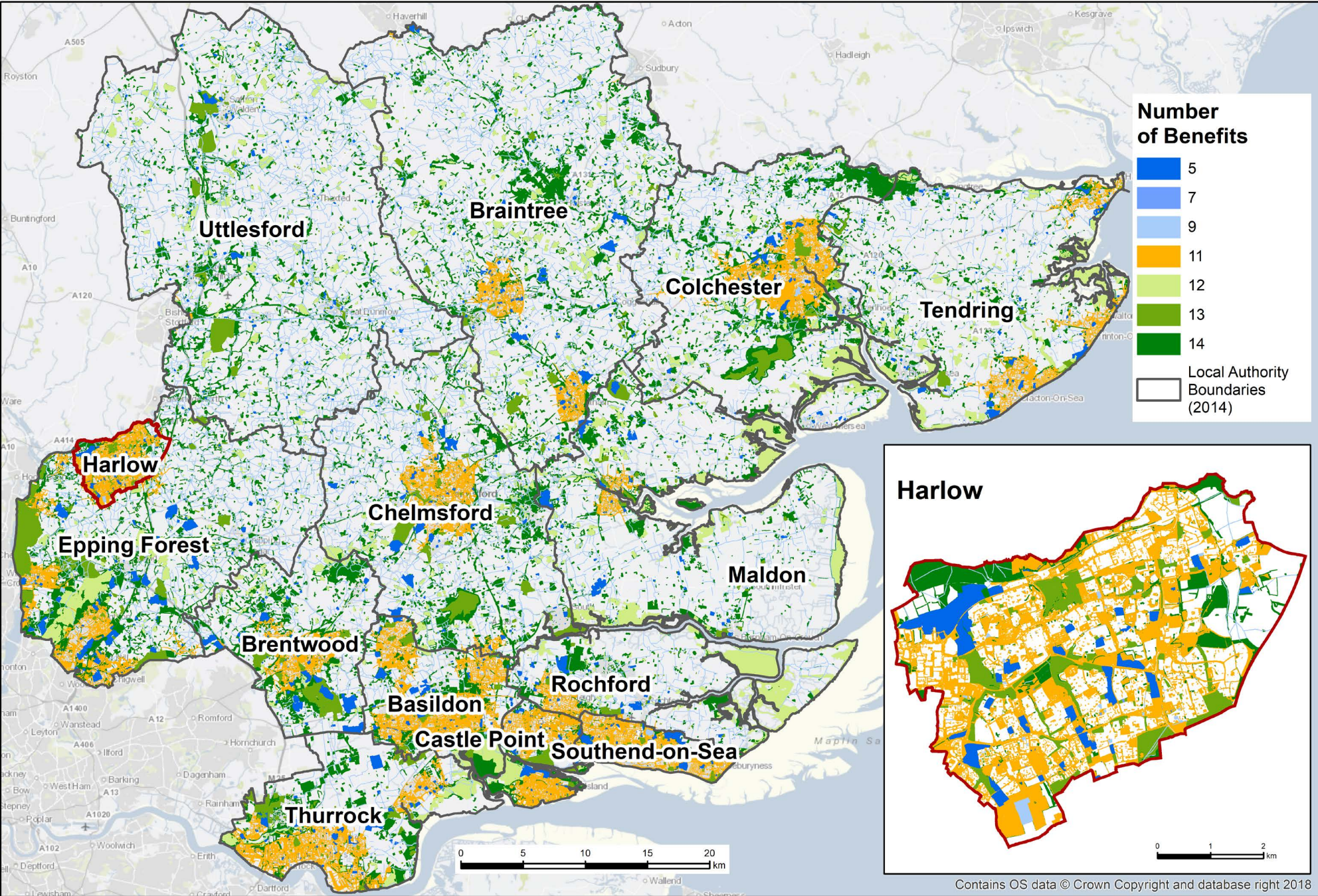
Appendix B8 - The Benefits to Essex From Green Infrastructure

There is further increasing evidence that green infrastructure has significant potential to contribute to delivering the benefits to the people of Essex as summarised below:
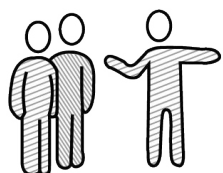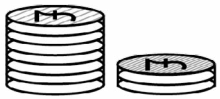
People

- Improves quality of life for people
- Creates cohesive communities - cleaner, safer and greener.
- Benefits children's intellectual, emotional, social and physical development, giving them the best possible start in life through connecting children with nature and green spaces. [a]
- A study to improve playgrounds knowns as 'Super grounds' found that 99 % of the participating schools said the programme had a lasting impact on teaching practice and attitudes to learning. [b]
- A survey with over 4,000 UK adult residents participating enable to differentiate average Willingness to Pay values between various socio-demographic groups. The Willingness to Pay value of parks and green spaces:
  - For lower socio-economic groups doubles when welfare weighted for income, increasing from £2.00 to £4.32 per month.
  - To BAME communities also increases significantly when welfare weighted from £3.05 to £5.84 per month.
  - Urban residents value parks and green spaces higher than the UK average Willingness to Pay value at £2.89 per month, and this value increases after welfare weighting to £3.93. [d]

Development and Growth

- Increase in land and house prices, for instance it is estimated:
- 3- 20 % premium added to value of land near green space (based on average of what developers would be willing to pay). [h]
  - Having a well-managed green space nearby was found to result in average property premiums of 2.6% to 11.3%. [l]
  - Living within 600m of a park in London adds 1.9 to 2.9% to property value, while a high-quality park could add 3-5%. [e]
  - Up to 7% premium for property in areas with trees, while city parks can add 10%; local parks 8% and amenity spaces 2.6% to value of nearby property [j]
- They can encourage further property development in an area and increase local council tax receipts as a result. [i]
- Reduction in insurance premiums.
  - Green infrastructure can mitigate the impacts of extreme weather events, therefore decreasing the insurance risk.
- Provide capital savings
  - The integration of green infrastructure into traditional grey infrastructure and in part replace can significantly lower construction costs and maintenance through the introduction of measures such as swales, rain gardens, and green roofs and the disconnection of downpipes to reduce the volume of storm water entering wastewater drains.

Source: A: (Natural Learning Initiative (2012); B: Landscape Institute, 2013); D: Fields in Trust, 2018); E: (Houses of Parliament Post Note, 2016); H: (Gensler, 2011); I:(Forestry Commission, 2012); J: (CABESpace, 2005); L:CLES & Groundwork, 2007)

Economic growth

Green infrastructure is vital to key sectors such as tourism and agriculture.

- Visitor spending in 2013 saw that 1 in 3 visitors to UK visit parks or gardens, more than museums, castles, historic houses or art galleries
- Visitors to parks spend on average £7.8 million [n]

Half a million people a year volunteers in green spaces in the UK, creating an estimated £30 million in value. [o]

- The annual UK economic value of the work of community groups in parks and green spaces ranges between £17 million and £35 million. [o]
- Between 2007 and 2008 BTCV volunteers put in 540,178 workdays. If these are valued at a typical unskilled labour rate of £50 a day, the total contribution amounts to over £27 million. [o]

BTCV estimated that for every £1 invested in environmental volunteering in the UK can lead to a return of up to £4 (400% returns). [p]

Increase in economic activity such as:

- Growth in the occupancy of vacant commercial and industrial space.
- Small businesses choosing a new business location rank open space, parks and recreation as a top priority.
- Good-quality public environment could improve commercial trading by up to 40% by attracting more people into the area, while generating significant private sector investment. [k]

- The investment into green infrastructure of the redevelopment of Riverside Park Industrial Estate in Middlesbrough attracted new, high profile, occupants and saw occupancy grow from 40% to 78%, and levered over £1 million of private investment. 28 new businesses started up. Over 60 new full-time equivalent (FTE) jobs created. [l]

Job creation and New employment opportunities from inward investment.

- Creating new economic opportunities for training, re-skilling and new business ventures in land management and natural environment related careers.
- Regeneration of Glasgow Green generated £8 million in additional salaries, and 35 FTE jobs. Increase in jobs was 28% 1998-2006. Increase in employees in other parts of the city for the same period was 13%. [m]

Reduced illness and absenteeism, improving labour productivity.

- Workers with access to green infrastructure are healthier and more productive. [l]

Managed woodland is often in productive use such as timber for construction and chip board and are also sources of raw materials such as lignin and cellulose –the output of forestry goods with a market value tends to increase by over £200 a year with each additional hectare/0.01km^2 of woodland.

The forestry and primary timber processing sector in 2010 contributed £1.7bn in gross value added and employed around 14,000 people directly. [1]

Source: K: (CABESpaces, 2014); L:CLES & Groundwork, 2007); M: Gen Consulting, 2006); N: (VisitBritain, 2013); O: (GreenSpace, 2011); P: (BTCV, 2008); Q: National Trust, 2018); 1: (Economics, 2017)

Social and health

- Reduction in health service costs.
    - The estimated saving to the health service could be in the order of £2.1 billion per year in England from good access to green spaces. [c]
    - Parks and green spaces alone are estimated to save the NHS around £111 million per year based solely on a reduction in GP visits. [d]
- Increases physical activity
- Where people have good perceived and/or actual access to green space they are 27% more likely to be physically active. [c & d] At a national level, levels of physical activity are higher in areas with more accessible green space with people achieving the recommended amount of physical activity. [e & f]
- A correlation has been observed between those living closest to green spaces and reduced levels of mortality caused by cardiovascular disease, obesity and obesity-related illnesses. [e] Studies in the Netherlands have linked increased green space to increased perceived health and reduced prevalence rates of a few diseases, such as diabetes. [g]
- A link has been observed between areas with more accessible green spaces are associated with better mental and physical health.eg.
- Across the UK an estimated £34.2 billion worth of wellbeing benefits per year are delivered by frequent use of parks and green spaces. [d] Almost 90 % of the 108 people taking part in a Mind study said that doing physical exercise outdoors in a natural environment was either important or very important in determining how they felt. [b]

Source: B: Landscape Institute, 2013); C: (Natural England, 2009); D: Fields in Trust, 2018); E: (Houses of Parliament Post Note, 2016); F: (E. Coombs, 2010); G: (Houses of Parliament Post Note, 2013);
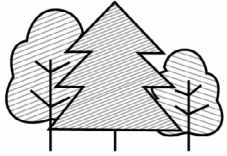
Environment

- The contribution of parks and green spaces worth up to £1.2 billion, significantly more than £16 million for management and maintenance
- Through a natural capital accounting approach of Sheffield's public parks, Vivid Economics also found that for every £1 spent on public parks, society receives £34 of services – 60% of which is to physical and mental health. [q]
- Green infrastructure can provide a recreation and visitor resource
  - Encouraging more outdoors lifestyle
  - For instance, a new coastal walking routes and open space that will extend the length of Essex's coastline will be a major tourist attraction as well as local resource.
- Enhance and improve biodiversity
  - Species movement between habitat patches was approximately 50% greater if corridors were in place compared to patches that were not connected by corridors. [r]
  - Streets with trees can contain a higher number and diversity of birds and invertebrate if they connect directly to a green space.
  - A mature oak can host up to 5,000 different species of invertebrate that will form the basis of a healthy food chain that benefits birds and mammals. [s]
- Helping to divert and manage pressure from landscapes which are sensitive to climate change.
- Reducing soil erosion - using vegetation to stabilise soils that many be vulnerable to increasing erosion

- Reduce noise pollution
  - Grass surfacing alone can reduce noise levels by up to 3 decibels compared to concrete paving
  - A border of trees and shrubs 30 metres wide can reduce noise levels by 5-10 decibels. While 10 meters wide can reduce noise from traffic by 3-8 decibels - more effective than man-made barriers. [j]
- Improve Air pollution
  - Urban vegetation could contribute to 9.1% of suspended particles removal, 5.3% of Sulphur Dioxide (SO_2) and 2.6% of Nitrogen Dioxide (NO_2).
  - 12 %of air pollution in urban areas is attributable to the Urban Heat Island effect due to temperature dependent formation of pollutants such as VOCs and Ozone, therefore the planting of street trees to reduce air temperature can also have a significant effect on air pollution. [t]
  - A study suggested that doubling tree cover across the West Midlands could reduce the concentration of fine particulate matter by 25%, preventing 140 premature air pollution-related deaths in the region. [j]
  - Landscape – the 4 Natural England's National Character Areas in Essex, each of which is distinctive with a unique 'sense of place' form the basic units of cohesive countryside character.
- Intrinsic character and beauty

Source: J: (CABESpace, 2005); Q: National Trust, 2018); R: (GILBERT◊NORTON L, 2010); S: (Forestry Commission, 2010); T: (Beckett, 1998)

Climate change

- Moderating temperatures to ensure that towns and cities continue to be attractive and comfortable places to live, work, visit and invest. Vegetation creates shade, which reduces the risk of heat stroke and exhaustion. [e]
  - Urban parks are on average 1°C cooler than built-up areas during the day. [b]
  - 4.5°C warmer inside buildings in the winter and cooler in the summer because of green roofs and walls provide an insulating effect that reduces the transfer of heat between the external and internal environment, reducing the internal heating and cooling costs. [u]
  - Despite projected effects of climate change, adding 10% green space in high density urban areas will maintain current summer temperature levels up to 2080. [v]
  - If green cover in urban areas is reduced by 10%, surface temperatures will be 7°C or 8.2°C warmer by the 2080s. [v]
  - Vegetation can reduce the Urban Heat Island effect and cool the air by between 2°C and 8°C. [w]
- Managing water resources and reducing flood risk and surface water.
  - Green infrastructure can provide water storage and retention areas, reducing and slowing down peak flows, and thereby helping to alleviate flooding.
  - Green infrastructure can help to manage surface water and sewer flooding by reducing the rate and volume of water runoff; it intercepts water, allows it to infiltrate into the ground, and provides permanent or temporary storage areas.
  - A 10% increase in green cover could also reduce the volume of surface water runoff in extreme rainfall events by 14%, while 10,000 trees can retain approximately 35m litres of water per year, reducing flood risk. [e]
- Green space could reduce run-off in residential areas by 5% and increasing tree cover by the same amount could cause a further reduction of 5.7% [v].
  - Adding green roofs to all buildings in town centres, retail and high-density residential could reduce run off by 17 - 20%. [v]
  - Capital costs of traditional drainage can be more than that of Sustainable Urban Drainage Systems (SuDs), yearly maintenance costs are 20-25% cheaper for SuDS and around half the cost over a 60-year life span. [x]
- Carbon storage and sequestration
  - In a year, 100 mature trees remove 53 tons of carbon dioxide and 430 pounds of pollutants from the air and catch 538,000 gallons of rainwater.
  - They can save homeowners 20% on air conditioning costs and 2% on heating costs.
  - A study on Leicester estimated that 3.16kg of carbon is stored per one square metre of urban vegetation. [y]
  - While a carbon sequestration study in the USA estimated that the urban green spaces sequester 12 to 15 million tons of carbon per year. [z]
- Helping other species to adapt –
  - Providing a more vegetated and permeable landscape through which species can move to new 'climate spaces'.

Source: B: Landscape Institute, 2013); E: (Houses of Parliament Post Note, 2016); U: (CIRIA, 2007); V: (Gill, 2007); W: (Forestry Commission, 2013); X: (Duffy, 2008); Y (Davies, 2011); Z: (Qian, 2002); 1: (Economics, 2017)

Appendix B9 - Access and Inclusivity to Green Infrastructure Provision

A standard developed by Natural England, the Accessible Natural Greenspace Standard (ANGSt), sets out benchmarks aiming to ensure there is adequate accessible green space provision near to where people live. The Natural England's ANGSt sets out recommended distance to accessible green space as follows:

- No person should live more than 300 metres from their nearest area of natural green space of at least 2 hectares (0.02km^2) in size.
- There should be at least one accessible 20-hectare (0.20km^2) green space site within 2 kilometres from home.
- There should be one accessible 100-hectare (1km^2) green space site within 5 kilometres.
- There should be one accessible 500-hectare (5km^2) green space site within 10 kilometres.
- At least 1 hectare (0.01km^2) of Local Nature Reserve should be provided per 1,000 population (Natural England, 2010).

Most of the local authorities in Essex that have developed green infrastructure strategies or equivalent had set out provision requirement standards for new developments. The Essex Growth Infrastructure Framework (2017) set this out as shown in table 6, where available, the provision standards for each type of green space in each local authority per 1,000 new population (ECC, 2017).

Table 6: Table 6: Open Space Standards and Assessed Provision from the Essex Growth Infrastructure Framework (ECC, 2017)

Hectares per 1,000 population				
	Natural & Semi Natural open spaces	Parks & Gardens	Amenity Garden space	Allotments
Basildon	2.47	1.67	1.19	0.05
Braintree	2.00	1.20	0.80	
Brentwood	2.00			0.18
Castle Point	2.38	3.04	0.58	0.06
Chelmsford	1.00	1.65****	0.40	0.30
Colchester	5.00	1.76	1.10	0.20
Epping Forest	8.45*	0.32**	0.79***	0.33
Harlow	2.50	2.25	2.99	0.25
Maldon		1.16	1.16	0.20
Rochford	3.00		0.30	0.20
Southend-on-Sea	1.00	1.00		0.21
Tendring	3.87	0.13	1.66	0.22
Thurrock	2.00	0.70	0.80	0.16
Uttlesford	7.00		1.00	0.25
Essex Average	**3.28**	**1.35**	**1.06**	**0.20**

* includes new woodland provision

** provision standard 0.63ha/1000 Managed Open Space (including Parks & Gardens and Amenity Green space)

***provision standard 0.47ha/1000 Informal Recreation Grounds (a variation on the previous PPG17 classification for amenity green space)

****includes recreation grounds

As a result, the Essex Growth Infrastructure Framework local benchmarks found that most areas have sufficient natural and semi-natural green space, parks and gardens, except for Rochford, Tendering and Thurrock. While the provision of more informal amenity space is lacking across Essex. This is particularly the case in more built up areas and is exacerbated by the fact that the supply of green infrastructure is not matched up with areas that are most at risk in terms of health and deprivation (ECC, 2017).

Furthermore, the analysis undertaken by the Essex Wildlife Trust in 2009s of the accessible green spaces in Essex, using the Natural England's ANGSt. found the proximity to open spaces varied across the districts and, across Essex, there is a relatively low provision of small, local sites between 2 and 20 hectares (0.02-0.2km2):

- 29% of households had access to a site of at least 2 hectares (0.02km^2) within 300 metres.
- 68% of households had access to a site of at least 20 hectares (0.20km^2) within 2 kilometres.
- 72% of households had access to a site of at least 100 hectares (1km^2) within 5 kilometres
- 14% of households had none of the Natural England's ANGSt targets met (ANGSt) (EWT, 2009).

The analysis undertaken by UEA mapped the green infrastructure against the ANGSt benchmarks across Essex as shown in figure 5, and found that only two polygons met the ANGSt criterion of a 500-hectare site. In total, just over 50% of Greater Essex residents lived in locations meeting at least three of the access benchmarks, another 33% attained two benchmarks and 2% none at all. 40% of residents living in places in Braintree, Tendring and areas of Chelmsford and Uttlesford are achieving no more than a single benchmark.

In some areas the percentage of accessible green spaces is low due to deficiency of green spaces in the first place, in many instances the provision of green spaces may appear sufficient, but they remain inaccessible or access maybe limited. Rural communities were identified as being particularly affected by lack of access despite being in close proximity to more natural areas (ECC, 2017) (EWT, 2009). On the basis of Figure 5 there are parts of northern Braintree, northern Chelmsford, eastern Tendring and eastern Uttlesford that could merit further investigation of GI provision (BLGDRC, Lovett & Sünnenberg, 2019).

Some areas may not always be well served due to settlement evolution and the presence of barriers to access, such as motorways, trunk roads and railways, as well as people's perception of accessibility, facilities available and its inclusivity. These issues are particularly relevant to many parts of Essex. There are certain groups in society that are particularly vulnerable to social exclusion. These include people with disabilities, ethnic minorities, young people, older people and those at an economic disadvantage.

An ethnic and diversity study undertaken in 2005 reviewed the perception of under-represented groups1 within inner cities in accessing the countryside and found that while there were specific barriers to each group the majority were put off due to cost from lack of transport and any fees on site , fear for their safety, fear of segregation, accessibility due to lack of facilities and that they are not entitled to be there or not welcome to visit. The study revealed that disabled people, ethnic minorities and young people were keen to access outdoor recreation once they had 'tasted' the experience, although young people needed more active engagement. However, lack of information, economic circumstances and confidence were key factors preventing independent access (Countryside Agency, 2005). While, a separate study from 2010 found the green space that mattered most to people was the local park, which accounted for 90% of the green spaces all people used (CABESpace, 2010).

The UEA analysis also mapped the distribution of green infrastructure across 1,076 Lower Super Output Areas (LSOA) across Essex and compared the pattern of current green infrastructure provision against socio-economic variables, such as Index of Multiple Deprivation (IMD), population ethnicity and age distribution. The LSOAs were classified according to their values on two or more of the socio-economic characteristics and divided in to three equal groups on the basis of their IMD and population density values. The results indicated that the less affluent areas in the middle third of population density of the LSOAs (e.g. suburban areas) have a higher provision of green infrastructure, while the more affluent and densely populated areas of the LSOA has the lowest provision of green infrastructure. It implies that there are some differences in the distribution of the green infrastructure and accessibility according to the social-economic characteristics of areas. Figure 6 shows the green infrastructure clusters for 93 LSOAs identified with the lower provision of green infrastructure of which 53 of these LSOAs are concentrated geographically in Southend and Tendring, suggesting opportunities for further investigation (BLGDRC, 2019, See Appendix C1). Given that less than a third of households in Essex have access to such green space site within 300 metres, improved access and safety will have a huge effect on the number people from under-represented groups using the existing green spaces. For these groups, the potential that green space has for enhancing social cohesion is especially important.

Small changes in design, for example, locating crossings and cycle routes in relation to green space entrances, can help improve accessibility. Since 68% of Essex households have access to a site of at least 20 hectares (0.2km^2) within 2km, the improvement of connectivity to and creation of cycle routes and other greenways could encourage more people to switch their short car trips (under 5kms) to cycling or walking therefore promoting a modal shift towards sustainable access to these sites, as well as making these green spaces more inclusive reducing the cost to travel and easier to access.

Furthermore, an Essex Resident survey undertaken on behalf of Essex County Council in 2016 found that 78% of people of the 5,535 respondents were generally satisfied with the parks and open spaces in Essex, however since 2014 there was a decrease in people's views of ease of access to these parks and open spaces. When asked if these could be improved 48% thought the parks and open spaces should be promoted better, 47% believed the facilities should be improved, 33% wanted to make the access easier with public transport and 29% wanted them to be made safer (Q A Research, 2016). Further to this a UK-wide on-line survey on understanding public attitudes towards walking in urban parks and green spaces was conducted in May 2018. 1,000 people with regards to improving green spaces and accessibility found that 35% of people aged over 75 would walk more often if there were more benches available and 67% would walk more often if green spaces were better maintained (The Ramblers & TCPA, 2018).

It is important that the potential benefits of existing green spaces are fully realised to support growing and changing populations. By exploring the existing green and open space in Essex to see if there are new opportunities to transform them into biodiversity rich and people friendly green spaces. This may require improved management, promotion and greater multifunctionality of green spaces. While impacts from development will need to be mitigated not only through the provision of new strategic green spaces but also by enhancing the quality of the existing sites, improving access and wider landscape management practices (ECC, 2017).

Figure 5: ANGSt benchmark result for Greater Essex - Note: Calculations based on a gridded population surface derived from 2011 Census headcounts
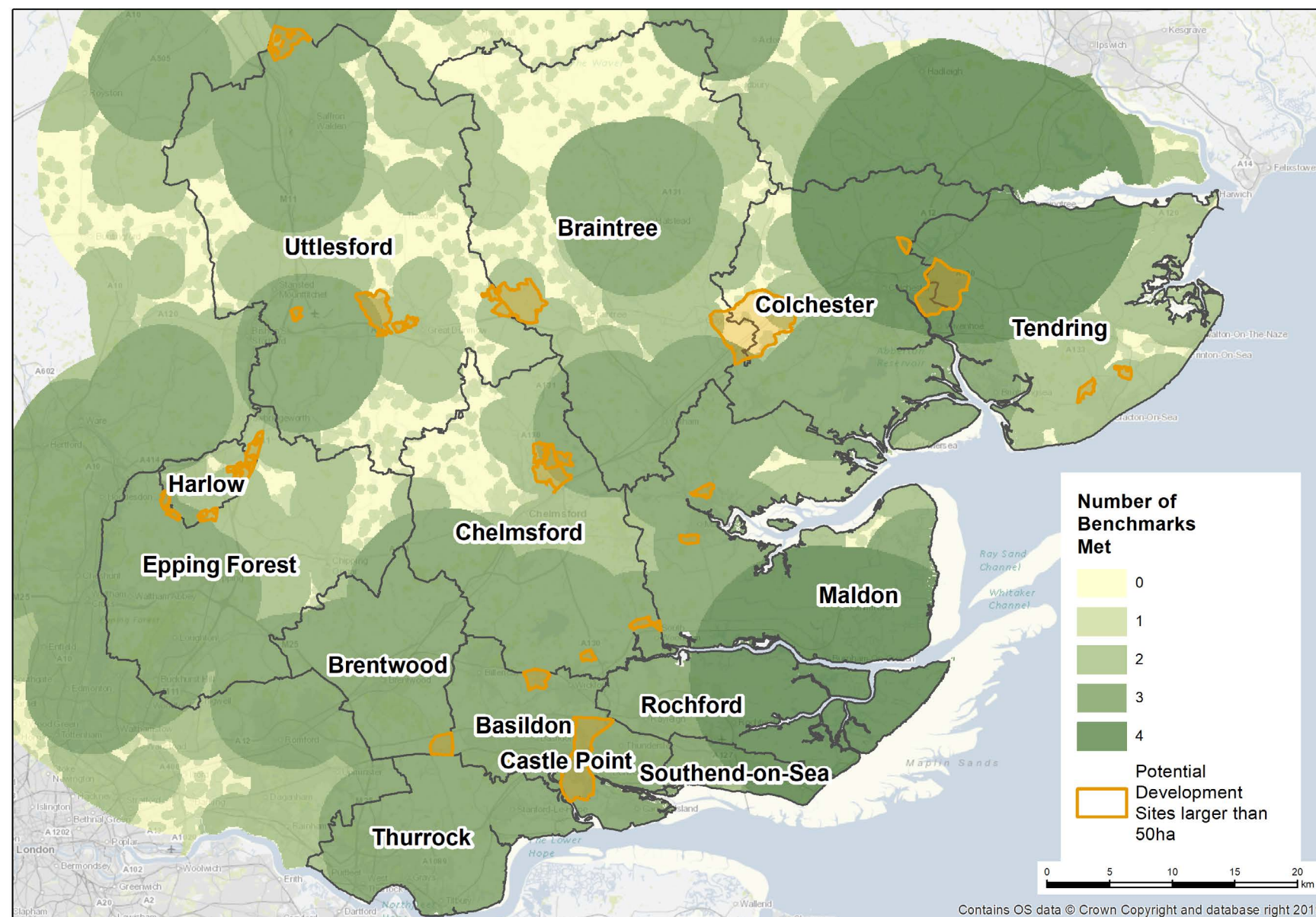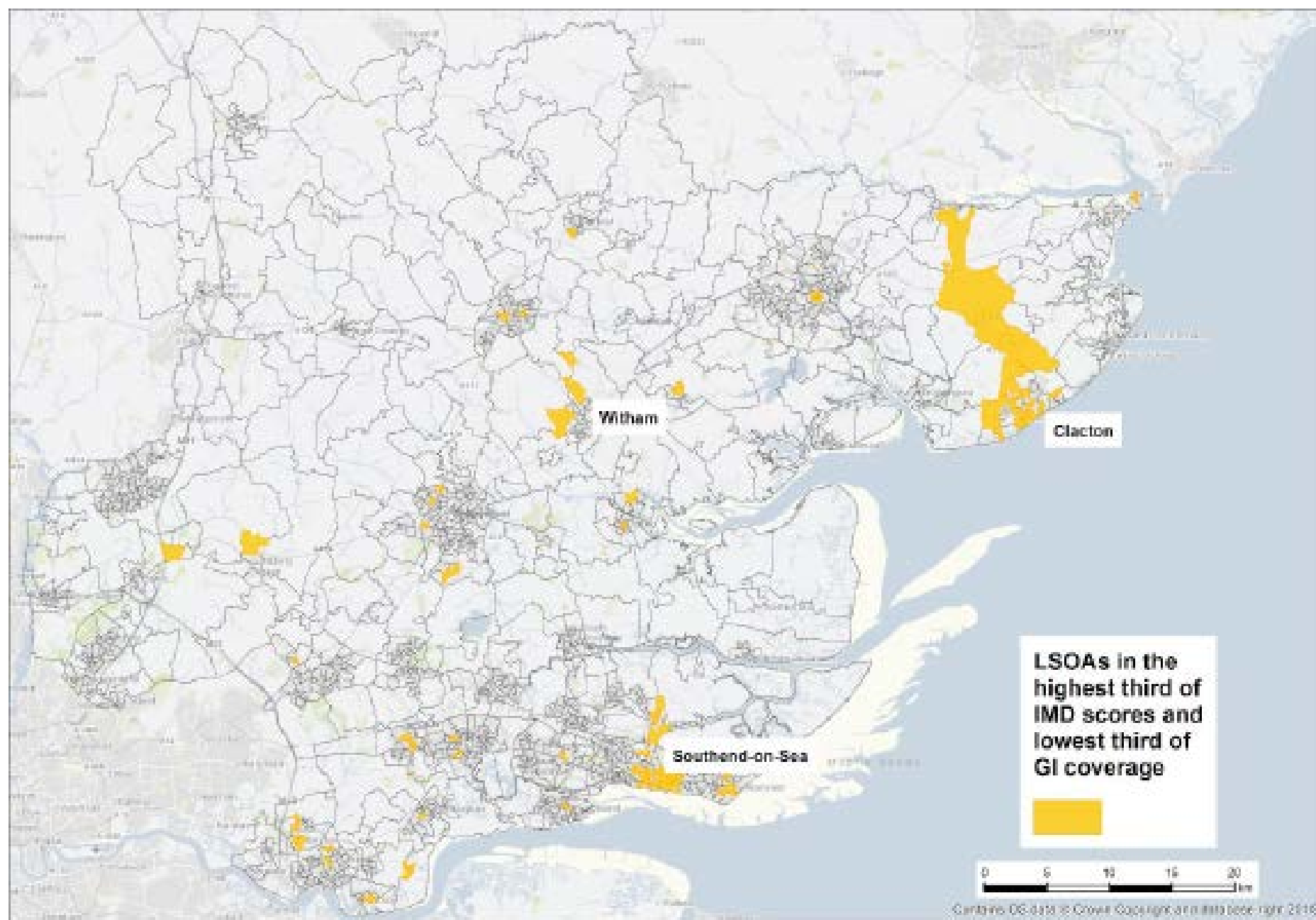
Figure 6: The distribution of LSOAs with higher IMD scores and a lower percentage coverage of green infrastructure assets

Simple measures that developers, landowners, private, public and third sector authorities such as planners, parks, conservation and highways could consider in improving existing green infrastructure for example:

- Protect, maintain and enhance the ecological and heritage value of green infrastructure and foster sense of place
- Undertake an audit of public or private green infrastructure to assess their functionality and benefits against the community needs. Which might suggest creative ideas to be incorporated into grounds maintenance contracts such as new paths and benches.
- Look to improve the quality of existing green infrastructure through remedial work such as removing litter or graffiti, tackle invasive plant species or re-claim areas which had become wild or inaccessible.
- Seek opportunities to get communities and the third sector more involved in the development and maintenance of their local green spaces, through a variety of creative approach, such as:
  - Competitions
  - Litter Champions projects in schools
  - Path tidies
  - Formation of 'Friends Of' groups.

- Increase functionality and benefits from existing green infrastructure assets by:
  - Reviewing location of playing and sport facilities to assess opportunities to reduce habitat fragmentation in key wildlife corridors.
  - Improving the connectivity and network of greenways through target physical improvements to greenways routes that can also be promoted for local and visitor use.
  - Reviewing existing management plans for green spaces to look at multifunctional opportunities including a focus on biodiversity enhancements.
  - Establishing a culture and processes for long term management of green infrastructure.
  - Explore alternative models for managing open spaces to minimise overall costs to maintain or to become increasingly more economically self-supporting.

Appendix B10 - Green Infrastructure Recommendations

The concept of green infrastructure is firmly supported through national, regional and local policy and its wide-ranging benefits well evidenced. Despite this, in practice the green infrastructure is still undervalued and at worst viewed as a constraint on development and our public realm. Nevertheless, green Infrastructure is more than aesthetic, but fundamental part of our natural environment, which improves biodiversity, social interaction and our health and wellbeing. It is the essential ingredient that go into place-making and ensuring that place works effectively now and in the future. Therefore, the value of the green infrastructure needs to be at the heart of decision making for all those with a role in shaping, changing and managing the public realm and natural environment.
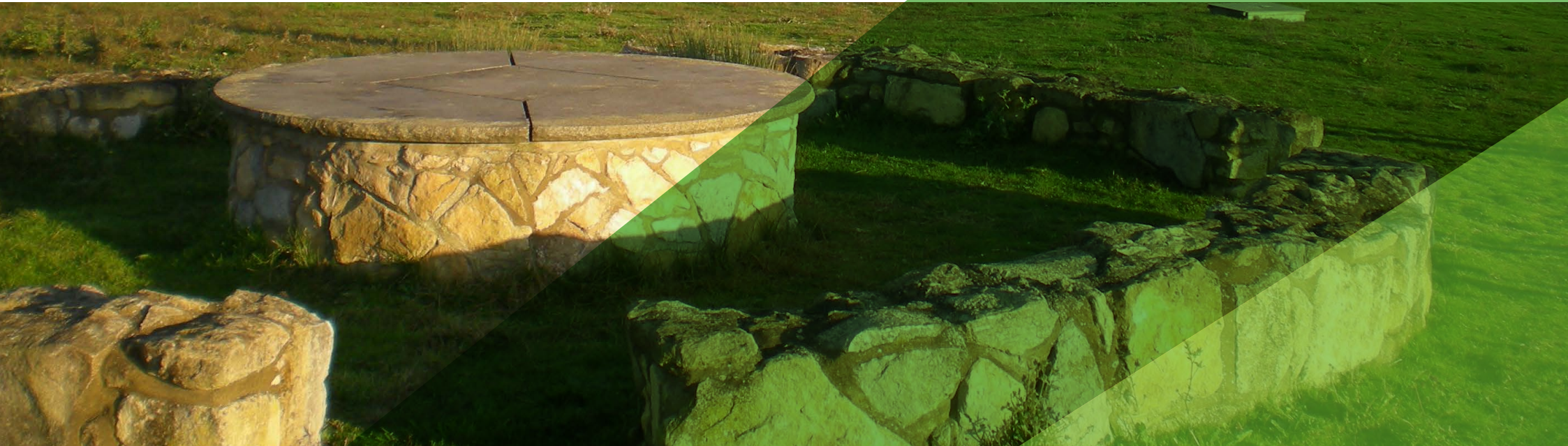
10.1 Planning

Consideration for strategic planning and development management policies and decisions should seek to achieve the following recommendations as a matter of good practice, or mitigation:

Recommendations: Planning
Protection and enhancement of existing urban natural green spaces and amenity open spaces
Adequate access to natural green space for new developments, in accordance with ANGSt, Building with Nature or similar standard, wherever possible. This can be delivered either through on-site provision or financial contribution as appropriate
Adequate access to amenity open spaces for new developments, in line with NPPF, Local Plans and local green infrastructure, open space strategy or equivalent. This can be delivered either through on-site provision or contribution to a scheme within close proximity to the site.
Financial contributions to be sought for ongoing maintenance when new green infrastructure assets are provided on-site within a development scheme.
Provision of additional natural green space, outdoor amenity open pace, green corridors and greenways to meet the needs generated by new development and linked to the wider green infrastructure network.
Protection and enhancement of existing green corridors and 'green lungs'/'fresh air corridors' (including Green Wedges, Green Edges and Strategic Gaps)
Promotion of new green corridors as part of new developments.
A development site is rarely an island and will require a review of what's going on outside the red-line planning boundary. Consider if there are other green infrastructure features that can be linked. Ensuring the creation of coherent, direct, safe, comfortable and attractive greenways linking to green spaces and green infrastructure.
Protection and enhancement of existing water courses and open bodies of water.
Promotion of new water courses and open bodies of water as part of new developments.
Protection of existing street trees and promotion of additional planting as part of new developments and designated street planting priority areas.
Greenspaces and trees recognised as essential elements in urban surroundings with 'minimum net increase' for loss of existing sites and trees due to development proposals (rather than no net loss).
Incorporation of landscape planting that provides shelter for buildings in exposed locations and shading in urban environments.
Implementation of small-scale green infrastructure measures and features on an individual level by housing and buildings such as green roofs, green facades, rain gardens and ponds.
Incorporation of environmental and biodiversity net gains and offsetting within development and landscape schemes for 'linking features'; such as transport and utilities infrastructure.
Green infrastructure policy should embrace a diverse, inclusive and comprehensive understanding of green infrastructure at different scales: the local authority areas, whole cities and towns down to single neighbourhood areas. It should aim to improve the multi-functional impacts of green infrastructure to maximise the benefits delivered to communities.
Consideration in marrying green infrastructure design with other strategies and masterplans proposal such as surface water management strategies and habitat networks (e.g. strategic drainage engineers, ecologists, landscape architects, utilities) to coordinate delivery and implementation.
Think about multi-functionality – green infrastructure works in multiple dimensions in several ways, for example a green roof provides a home for nature, has thermal benefits for the building, sound proofing, storm water retention, visual amenity, and pollution control. When looked at in this context the business case really does stack up for green infrastructure. It's not just about drainage or nice to have!

10.1.1 Supporting large and small developments

The key to planning and managing green infrastructure in new development is to consider the site in its context. This includes considering the features of the site and the networks of habitats, sustainable transport routes and water courses that surround it. General recommendations for planners when assessing proposals for new developments:

Recommendations: For planners
Make use of existing assessment and evidence of the state of the green infrastructure and the opportunities identified to enhance and connect with it.
Green infrastructure principles should be embedded from the start; site appraisal through to the design stages in developing masterplans. Rather than being something extra that has to be provided separately through developer contributions/obligations.
New development proposals should be required to demonstrate how the landscape proposals connect with wider ecological networks and help to make these more resilient
Ensure that communities have the opportunity to engage with their local green spaces in new areas
Where a proposed development has an impact on existing green infrastructure, ensure that the function and benefits lost through the development are offset.
Avoid development that would lead to the fragmentation of habitats. utilising existing features such as watercourses and future proposals such as transport corridors.
Consider compensatory provision to be made for the loss of existing green infrastructure from a proposal to provide for the provision of new and/or enhancement of green infrastructure on-site or off-site. Where appropriate, the local planning authority will seek to secure via planning obligation provision for the future management and/or maintenance of green infrastructure.

Ensure adequate access to natural green space for new development is in accordance with ANGSt, wherever possible. This can be delivered either through on-site provision or financial contribution as appropriate
Protection of existing street trees and promotion of additional planting as part of new developments and designated street planting priority areas.
Encourage the incorporation of landscape planting that provides shelter for buildings in exposed locations and shading in urban environments.
Encourage the implementation of small-scale green infrastructure measures and features on an individual level by housing and buildings such as green roofs, green facades, rain gardens and ponds.
Ensure that masterplans consider the design and layout of a green spaces for example:

Welcoming	Distinctive
• Include natural entrance and gateway features such as trees • Use natural features such as rivers or other natural landmarks as key part of the design to make it easy to find way around • Make good use of views to help to create places with a positive image.	• Reinforcing local landscape character and identity. • Using unique design features i.e. SuDS, green corridors and green facades • Use green infrastructure to create a sense of place
Easy to navigate	**Safe and pleasant**
• Connections for people through the development to join up to existing networks. • Connections for wildlife; integrate and enhance surrounding habitats where appropriate. • Where best to make green links and connections to strengthen and enhance the green infrastructure network.	• Well located; linking into wider green infrastructure network. • Address risks through design , such as lighting of a greenspace, boundary features to help define public and private spaces, SuDS, etc. • Delivering high quality design and maintenance.

10.1.1 Supporting large and small developments

Recommendations: For developers
Development proposals need to consider how they can integrate and assist with the delivery of green infrastructure objectives and make contributions to delivery either on-site or off-site.
An assessment of the capacity of nearby sites to absorb additional recreational use without causing detriment to the environment should be completed for new development sites. Access into these areas and buffering of the nearby sites should be incorporated into the design of new developments.
Assess sites for their context, identity and connection:

Context	Identity	Connection
• Location and surroundings • Natural features • Views • Topography • Hydrology • Microclimate (wind, heat etc) • Wider green network	• Landscape character • Green and blue corridors • Green spaces • Biodiversity • Habitats	• Pedestrian movement (greenways) • Vehicular movement, existing roads and transport connections • Habitat allowing species migration. • Water flow.

Protect and enhance existing biodiversity assets.
Seek opportunities to improve habitat connectivity within sites and with ecological networks beyond development sites.
Integrate biodiversity opportunities within new development
Make decisions informed by the best available ecological information and data

Secure the long-term management of existing and new habitats so that communities are engaged in the management and to enable further investment to be secured
Development should facilitate evaporative cooling and shading in order to increase amenity and reduce heat load.
Development which facilitates safe access to watercourse, whilst improving water quality and opportunities for leisure and biodiversity.
To strike an appropriate balance between the need to minimise land, energy and transport requirements in new developments and integrating sufficient green spaces and other GI elements.
The establishment of green active travel routes (walking and cycling) which minimise the need for motor vehicle movements, ensuring new developments are located where they can be linked to services and facilities
Dissection of the linear network of cycleways, public rights of way, bridleways and ecological corridors such as ancient woodlands, hedgerows, ditches and water environments are prevented. Developments should protect and enhance existing cycling and walking routes.
Maintain and, where appropriate, contribute to the network of green infrastructure i.e. public and private playing fields, recreational open spaces, parklands, allotments and water environments;
Contribute to improving the health and well-being of the local and wider community;
Incorporate either improvements to existing green infrastructure or the restoration, enhancement or creation of additional provision/areas, delivering multiple functions and benefits.
Incorporate either improvements to existing trees, woodland, landscape features and hedges or the restoration, enhancement or creation of additional provision/areas;

Create new green infrastructure either through on-site provision or financial contributions. Where on-site provision is not possible financial contributions will be required and be negotiated on a site by site basis;
Green infrastructure to be discussed in the pre-application consultations with the community, local planning authority and key agencies to help shape the masterplan at an early stage.
The long-term management and sustainability of green infrastructure should be considered when incorporating these features into a development. Where the long-term management of the business park or industrial development would typically be undertaken by a management company, it would normally be possible to integrate green infrastructure maintenance with standard arrangements, however where management and maintenance are more fragmented this would need to be considered.
Specifying the green infrastructure requirements into the standard engineering specifications to ensure it gets considered. Making the information as clear and detailed as possible makes for accurate costings, reducing the likelihood of elements such as green infrastructure being value out.
Ensure that the appropriate and relevant level of expertise, tailored to each project, is involved at the appropriate time (usually as early as possible).
Developing strong & mutually beneficial relationships/ partnerships with local partners such as The Wildlife Trusts can assist in design, delivery and speedy approvals through planning.
Developing strong & mutually beneficial relationships/ partnerships with local partners such as The Wildlife Trusts can assist in design, delivery and speedy approvals through planning.

When planning green infrastructure, it is vital to consider, from the earliest stage:

- revenue funding – to pay for the long-term care of the green infrastructure;
- capital funding – to pay for creating the green infrastructure; and
- the design of the green infrastructure – which will affect the cost of maintaining it as well as the cost of creating it.

(ref: Green Infrastructure and Housing Development 2016)

10.1.2 Green Infrastructure in Cities, Towns and Villages

Recommendations: Green Infrastructure in Cities, Towns and Villages
Protect and enhance existing green infrastructure, including natural green space, amenity open space, green corridors and vegetation.
Balance the need for inner-urban development or urban extensions with the potential impact on microclimate and the need to provide urban green space.
Seek opportunities to address identified deficiencies in access to natural green space or outdoor amenity open space within existing communities.
Increase urban green space to counter the urban heat island effect, including lining streets with trees and shrubs, providing open water bodies, developing green roofs and walls and minimising large areas of hardstanding. This is particularly pertinent in deprived neighbourhoods, which are typically less well endowed with green space and tree cover.
Protect and enhance existing green corridors, green wedges, green edges and strategic gaps (as designated in the Local Plan) from development and create new interconnections as fresh air corridors for the main built up areas.
Protect and develop small-scale greenspaces as fresh air filters for adjacent neighbourhoods where opportunities arise.
At the neighbourhood level it is important to think about how green infrastructure will integrate with existing roads, paths and surrounding development.
Create opportunities for easy access into the green network including accessible entrances in the right places and suitable paths. Making it easy to access will encourage residents and workers to use the green network for short journeys rather than using cars, helping reduce emissions and promoting active lifestyles.

Derelict sites due to delays in development - these stalled sites have potential to have a negative impact on local neighbourhoods, affecting the place's appearance and image. Temporary greening may be an appropriate way to create safe and attractive places until development can come back on stream.
Establish and sustain an effective maintenance programme for urban green space and trees to ensure vegetation thrives, particularly as climate change stresses increase.

10.1.3 Minerals and Waste Restoration

Recommendations: Minerals and Waste Restoration
Consideration should be given to how the site can contribute to the county's identified green infrastructure networks.
Ensure that new or extended minerals and waste related uses do not damage or destroy the county's existing environmental and natural assets, but that opportunities are taken (including via restoration) to enhance existing and planned green infrastructure networks and to support the identified landscape character areas of the county.
Minerals and waste development should seek to achieve a net gain in natural assets and resources, through: • delivery of wider environmental benefits in the vicinity where development would adversely affect locally designated sites or other features of local interest,   • protecting and enhancing green infrastructure and strategic biodiversity networks.
Sites connecting or adjacent to identified habitat areas and green infrastructure networks should be restored in a manner which promotes habitat enhancement, biodiversity net gains and multiple functions and benefits.
It is important that access is provided to green space following the restoration of sites and this can be secured in perpetuity by dedicating new public rights of way or open access areas.
Mineral and waste operators should consult the ANGST standard for the area within which they are located to identify whether their project has opportunities to address deficiencies.
Some restored areas may need access management to avoid the public conflicting with nature conservation interests.

Operators to develop restoration plans and to consider mitigation and enhancement opportunities which take into consideration:

- Climate change adaptation and mitigation (i.e.
- Creation of wetland or woodland habitat for storage of carbon.
- Provision of rainwater storage i.e. Reedbed etc.
- Planting with water purifying plants
- Orchards for food provision
- Green infrastructure provision
- Ecological network expansion through ensuring habitats on-site provide links to surrounding habitats allowing for species association and movement.

10.2 Highways

The existing road network could be improved through for example:

Recommendations: Highways
Stronger protection for landscape and heritage from road schemes.
Enhancements to the road network should be of high design standard, responding to a local sense of place, provide environment net gains and wherever possible be in harmony with the natural, built and historic environments.
Green bridges to connect wildlife areas across busy roads.
Consider retrofitting green infrastructure solutions to existing roads, dealing with the effects that roads have on nearby people, places, the historic environment and biodiversity, and potentially making best use of the land around the road network.
Use vegetation to limit traffic speeds by limiting excessive forward visibility, whilst maintaining appropriate driver sightlines.
Tree planting to improve flood protection and cut pollution.
'Hotspots' for air pollution are typically un-vegetated areas. For instance, large roofed areas and car parks. The provision of improved green Infrastructure could focus on these key hotspot areas; for example, tree planting, ground cover planting, hedge troughs, green roofs and green walls.
Use existing information from Surface Water Flood Management Plans and Critical Drainage Areas on priority outfall, soak away, culvert and flood risk hotspots to develop a programme of interventions.
Better provision for walkers, cyclists, equestrians and bus passengers linking in to the existing Public Rights of Way and cycle network to make non-motorised movement easier.

Improve our knowledge of our green infrastructure assets along our road network to form an environmental baseline to identify existing environmental problems that can be improved. For example: Identify works that will halt the loss to biodiversity and contribute to the ambition of environment net gains; such as reviewing opportunities for contributing to restoration areas and designated nature sites.
Explore opportunities to work in partnership with Highways; England, the Districts, City and Borough Councils and two unitary authorities to coordinate the delivery and management of green infrastructure within the road network in line with Highways; England's Road Investment Strategy (Government, 2018).
When planning green infrastructure, the expected future maintenance and upkeep should always be included in calculations (life-cycle costs). For instance, consider: • Selecting plants that are sufficiently resistant to urban stress factors or can be kept vibrant and healthy in the long term through appropriate maintenance measures. • Green infrastructure projects that combine aesthetic appeal and planting that is valuable to the urban ecology with underlying conditions of low maintenance costs to achieve cost transparency. • Differential mowing regimes (perhaps coupled with native wildflower planting) could improve the biodiversity value of highway verges, as often they are relatively undisturbed and can provide corridors for wildlife. In addition, swathes of wildflowers will create more attractive roadsides.

10.2.1 Greenways

Recommendations: Greenways
Including green infrastructure in Environmental Impact Assessments and Strategic Environmental Assessments for transport projects or programmes.
Creation of coherent, direct, safe, comfortable and attractive greenways linking existing and new green spaces, communities and places.
Working with partners to identify funding and mechanisms for the implementation and long-term maintenance of green infrastructure along our transport network.
Identify opportunities for connecting with new developments to existing greenways (i.e. Public Rights of Way and cycle paths) and green spaces.
Every effort to be made to ensure that connections between different sites are achieved to ensure that routes make sustainable connections that people will choose to use for local trips instead of the car.
Expand network within the county and cross border by working with neighbouring authorities to enhance the greenways routes, and ensure their quality is improved and maintained to encourage an increase in cycling and walking within and through Essex.
Work alongside the Essex Rights of Way Improvement Plan, Local Transport Plan, Local Walking and Cycle Infrastructure Plans and walking strategies to maintain and improve routes and enhance the green infrastructure network.
Review the Local Transport Plan and Essex Rights of Way Improvement Plans to provide an opportunity to identify and deliver network links and embed green infrastructure solutions to active travel and sustainable transport within mainstream transport planning.
Maximise management of existing and new Public Rights of Way, cycleways for wildlife.

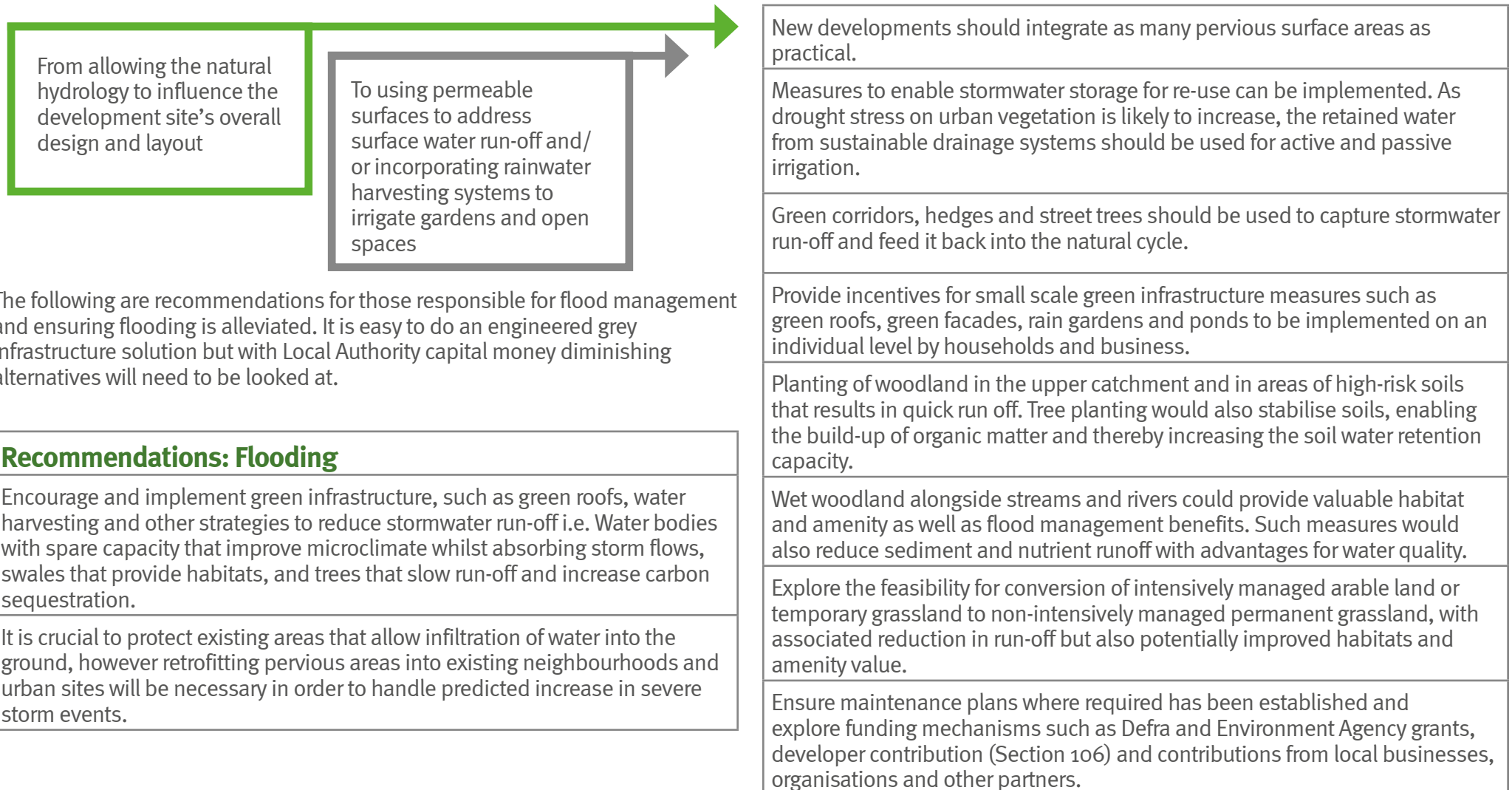| Manage the railway path (Flitch Way) to provide a quality multifunctional green corridor for community and wildlife.	
Key characteristics to consider in creating new greenways, include:	
Connectivity	What was being connected? people, wildlife, water
Width	Floodway, floodplain, other riparian areas (tributaries etc.)
Access	For whom and how much? recreation, transportation, wildlife protection
Trail type	Wide and hard, narrow and soft?
Level of development	Appropriate to surroundings and land use plan

10.3 Greenways

The existing road network could be improved through for example:

Recommendations: Coast
Coastal planners and other decision makers responsible for the coast should strive to identify the approaches best suited for a given location. It is important to consider the ecological suitability, impacts on habitat connectivity, risk of invasive and timing of installation to optimise colonisation by native species.
Identify site-specific needs and undertake a site assessment. This process should include determining the: • type of shoreline (slope of bank), • rate at which the shoreline is eroding, • forces that are eroding the shoreline, and • water depth, type of substrate, and salinity of the water body.
Integrate the results of a green infrastructure functions and benefits assessments into broader planning and decision-making frameworks in order to inform strategic selection among resilience and risk-reduction alternatives.
Understanding key factors that are often included in decision making contexts is a critical part of efforts to advance coastal green infrastructure implementation and assessment. These factors to be considered include: • Management objectives • Site characteristics and scale • Socioeconomic considerations • Policy directives • Time-dependent considerations • Trade-offs (i.e. potential changes to ecosystems, time lag between implementation and associated economic and ecological benefits) • Financing

The ecological suitability of different enhancements needs to be considered across the design life of the structure, taking into consideration predicted changes in sea level. As the design life of hard engineering structures is often 80-100 years, it is possible to create future habitat capacity as sea levels rise to reduce the risk of coastal squeeze.
Consider how coastal green infrastructure may be positioned relative to both the current and future projected tidal and seal level rise in order to maximise engineering and ecological performance.
Restoring, protecting and enhancing existing marsh lands, estuaries etc for coastal resilience.
Explore feasibility for land to be reclaimed for a green infrastructure approach to coastal improvement through the creation of a living shoreline.
Through maintenance and restoration programmes to protect and Improve access to the coast path in Essex.
Explore opportunities from the RAMS schemes to protect important coastal nature conservation sites in Essex.

Source: (Naylor, 2018)

10.4 Flooding

SuDS and Natural Flood Management can feature at a strategic level down to street level.

| From allowing the natural hydrology to influence the development site's overall design and layout | To using permeable surfaces to address surface water run-off and/or incorporating rainwater harvesting systems to irrigate gardens and open spaces |

The following are recommendations for those responsible for flood management and ensuring flooding is alleviated. It is easy to do an engineered grey infrastructure solution but with Local Authority capital money diminishing alternatives will need to be looked at.

New developments should integrate as many pervious surface areas as practical.
Measures to enable stormwater storage for re-use can be implemented. As drought stress on urban vegetation is likely to increase, the retained water from sustainable drainage systems should be used for active and passive irrigation.
Green corridors, hedges and street trees should be used to capture stormwater run-off and feed it back into the natural cycle.
Provide incentives for small scale green infrastructure measures such as green roofs, green facades, rain gardens and ponds to be implemented on an individual level by households and business.
Planting of woodland in the upper catchment and in areas of high-risk soils that results in quick run off. Tree planting would also stabilise soils, enabling the build-up of organic matter and thereby increasing the soil water retention capacity.
Wet woodland alongside streams and rivers could provide valuable habitat and amenity as well as flood management benefits. Such measures would also reduce sediment and nutrient runoff with advantages for water quality.
Explore the feasibility for conversion of intensively managed arable land or temporary grassland to non-intensively managed permanent grassland, with associated reduction in run-off but also potentially improved habitats and amenity value.
Ensure maintenance plans where required has been established and explore funding mechanisms such as Defra and Environment Agency grants, developer contribution (Section 106) and contributions from local businesses, organisations and other partners.

Recommendations: Flooding
Encourage and implement green infrastructure, such as green roofs, water harvesting and other strategies to reduce stormwater run-off i.e. Water bodies with spare capacity that improve microclimate whilst absorbing storm flows, swales that provide habitats, and trees that slow run-off and increase carbon sequestration.
It is crucial to protect existing areas that allow infiltration of water into the ground, however retrofitting pervious areas into existing neighbourhoods and urban sites will be necessary in order to handle predicted increase in severe storm events.

10.5 Energy

Recommendations: Energy

To encourage developments and energy transmission infrastructure to enhance the natural environment, providing a comprehensive green infrastructure network and net biodiversity gains, and uses zero-carbon and energy-positive technology to ensure climate resilience.

Development of green infrastructure elements (e.g., green roofs, urban trees, green belts) may reduce energy costs, both for heating and cooling in urban environments. Energy cost reductions have to be compared to investment costs to derive net benefits. These considerations are central to the Garden Communities Themes and Principles (AECOM, 2018).

Maximise the opportunities for green infrastructure assets to contribute to energy production or reducing energy consumption.

To consider the landscape and green infrastructure impacts of new energy production proposals.

Support and encourage delivery of green infrastructure schemes in order to mitigate and compensate for the impacts and harms of major energy projects.

Establish education programmes to develop professional and expert skills in the field of renewable and alternative energy

Develop attractions around the energy theme with recreational and educational value to locals and visitors.

Bioenergy

Wood is to be taken from sustainably managed woodlands.

Take a coordinated approach working across Districts to identify clusters of smaller woodlands within local areas that could meet local wood heat markets (either existing or potential).

Explore feasibility to link up with prime wood fuel candidates, such as schools.

Reforestation and sustainable forest management should be made to avoid adverse effects on biodiversity and ecosystems.

Renewable Energy

Seek to draw links between wind and solar energy generation and green infrastructure through the multifunctional use of the area taken up by wind and solar farms.

Explore feasibility for combined uses of sites and think creatively about how the space can be shared between green infrastructure and energy production. I.e. recreational and educational facilities.

Important that renewable farms avoid ecologically sensitive sites, for example, sites within or functionally linked SPAs.

Conserve existing hedgerows and mature trees around the site.

Promote the diversity of hedgerow species and existing grasslands.

Kent County Council has produced a Position Statement of Development for large scale solar arrays. The paper provides guidance for solar developers on which sites would be acceptable for development of solar farms. The document considers the impact on the landscape, biodiversity, agricultural land and Green Belt.

Nuclear

Follow the recommendations within the Habitat Regulation Assessment for Bradwell.

Undertake landscaping work on and along the site's boundaries to provide environment net gains, for example:

- Raised planting area
- Footpaths and bridleway
- Create ponds, SuDs etc.

10.6 Health and wellbeing

10.7 Eduction

Recommendations: Health
Encourage cross generational outdoor activities to promote exercise and facilitate better communication and interaction at various levels and scales. For example, establishing a 'Green Gym' programme with Active Essex that would support and encourage sports clubs who would use the Green Lanes network regularly, such as horse riders, cyclists and rambling groups.
Work with providers of green space, health professionals, communities and Active Essex to establish of link into existing green care programmes.
Ensure there is inclusive and safe access to green/ recreational spaces.
Socially cohesive greenspaces should be publicly accessible, perceived as welcoming and provide room for encounters and self-regulation.
It is important to consider the equality or access to green infrastructure and the fostering of different user interests for a more equal distributions of green infrastructure related benefits.
Take into considerations the lessons learnt from the Active Essex Local Delivery pilots.
Support active and healthy lifestyles through improving accessibility to amenity green infrastructure assets, including improved walking and cycling connections. For example, identify a priority walking and cycling route between green spaces and the town centres etc. as a public realm scheme.

Examples of recommendations to consider in public engagement and awareness raising of green infrastructure in connecting families to nature.

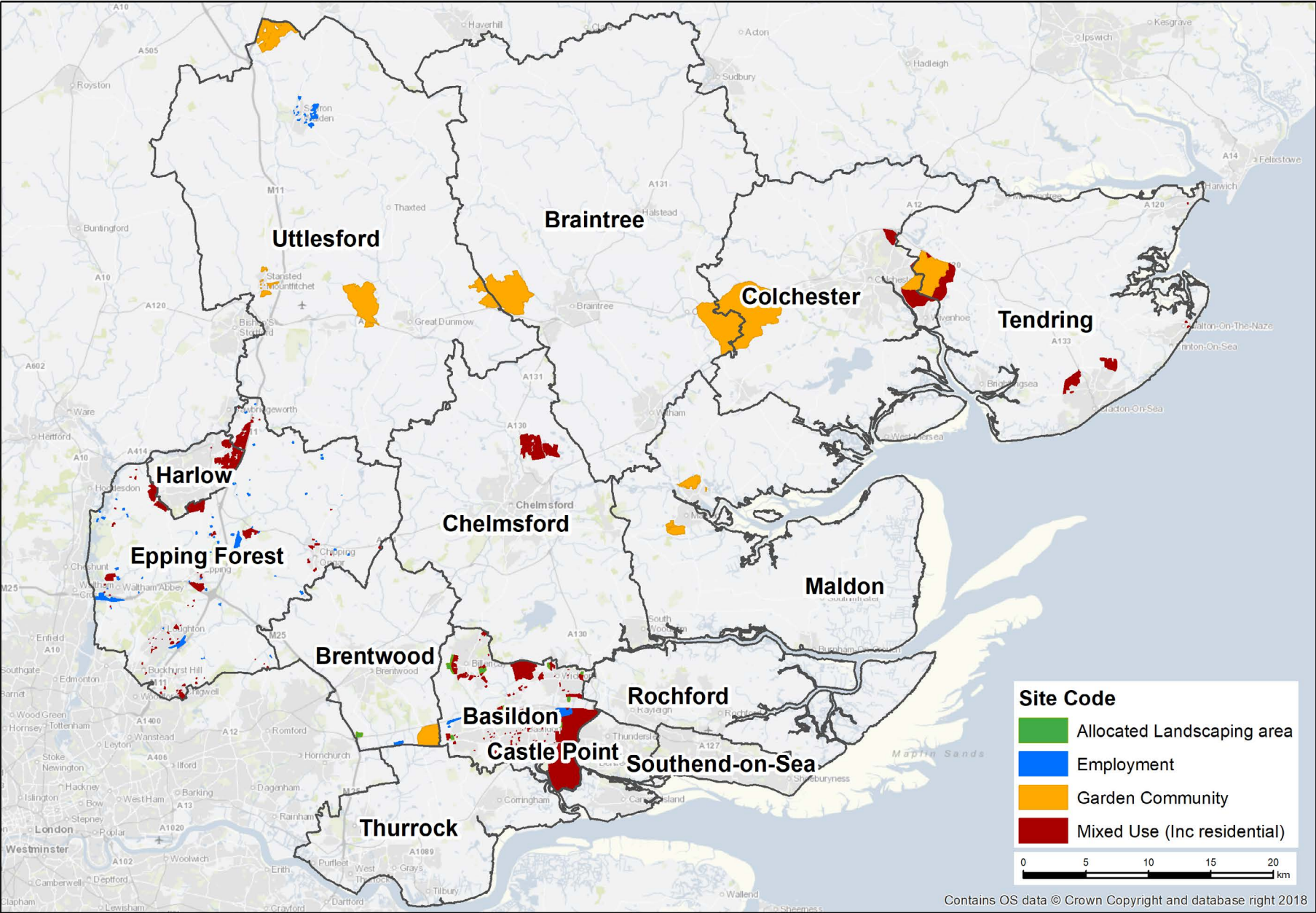| Recommendations: Education |
|---|
| Enable community engagement in the identification, design and management of GI programmes and projects. For example, begin or support a community engagement programme to identify a shortlist of underutilised open spaces, which could be redesigned as parks. |
| Outreach work can be a valuable way to increase involvement and use of green spaces to:

• Help alleviate problems between different park users.
• Provide a means for young people particularly to feel ownership towards a park when they feel involved in the development of facilities designed for them. |
| Extend the provision of facilities for teenagers, ensuring their involvement in choosing what they want. Research with young people shows that somewhere which is 'their' space to meet, such as swings designed for them rather than younger children, is sometimes all that is needed.

• Provide a network of larger and better natural play spaces and/ or using natural materials or a mix of natural and traditional equipment will offer a wider range of experiences and challenges for children. |

Appendix B11 - Map of the Proposed Development Sites over 50 Hectares in Essex

Figure 7 Map showing the proposed new development sites greater than 50 hectares in size from the Local Plans in Essex[2]

Site Code
- Allocated Landscaping area
- Employment
- Garden Community
- Mixed Use (Inc residential)

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Appendix B12 - Map of the Greenways Network

Figure 8: Greenways map and promoted paths

PROWs and Promoted Paths in Essex

Essex Local Authorities (2014)

Promoted Routes

PROWs

Local Authority Boundaries (2014)

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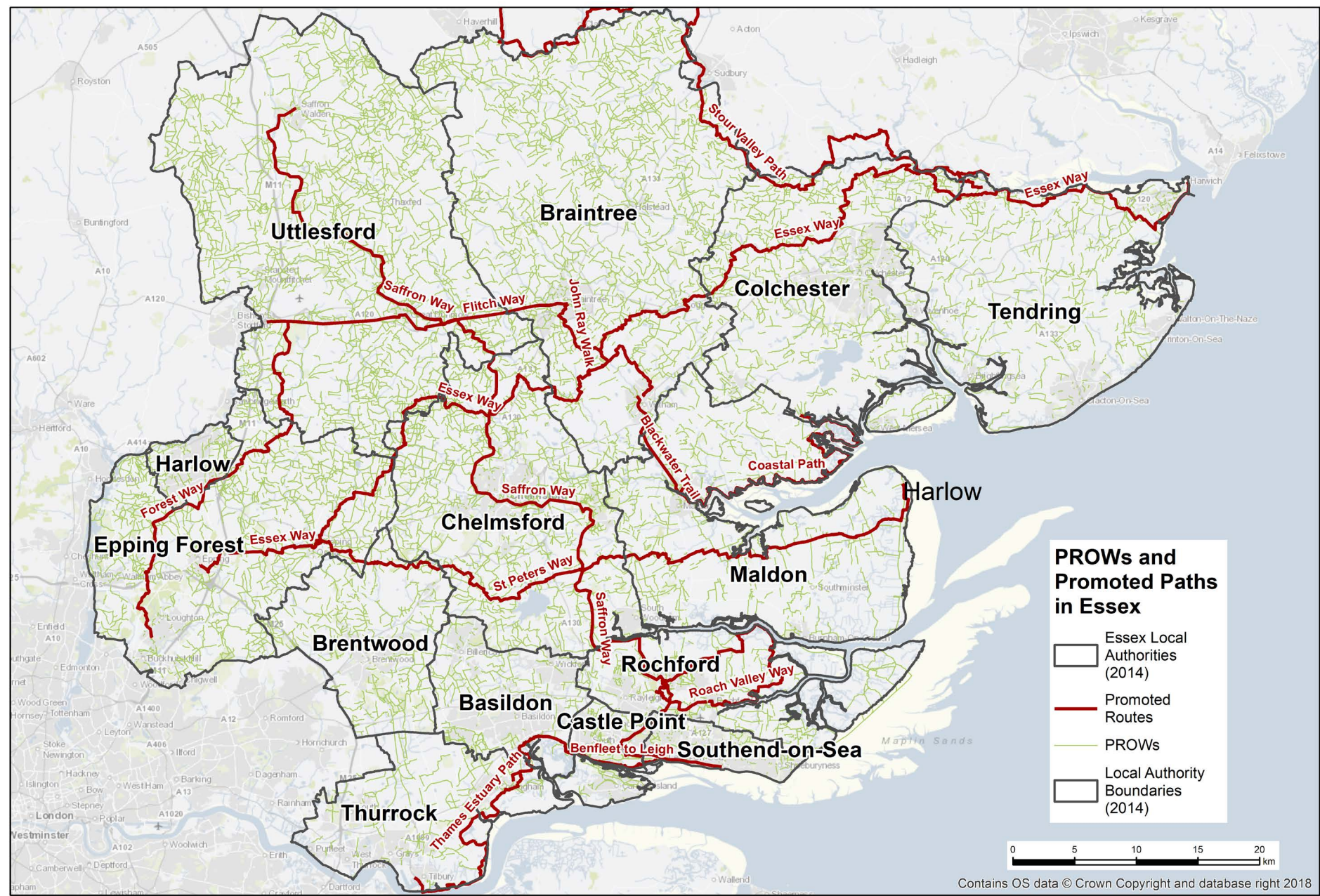
Figure 9: Length of PRoW in each Local Authority area
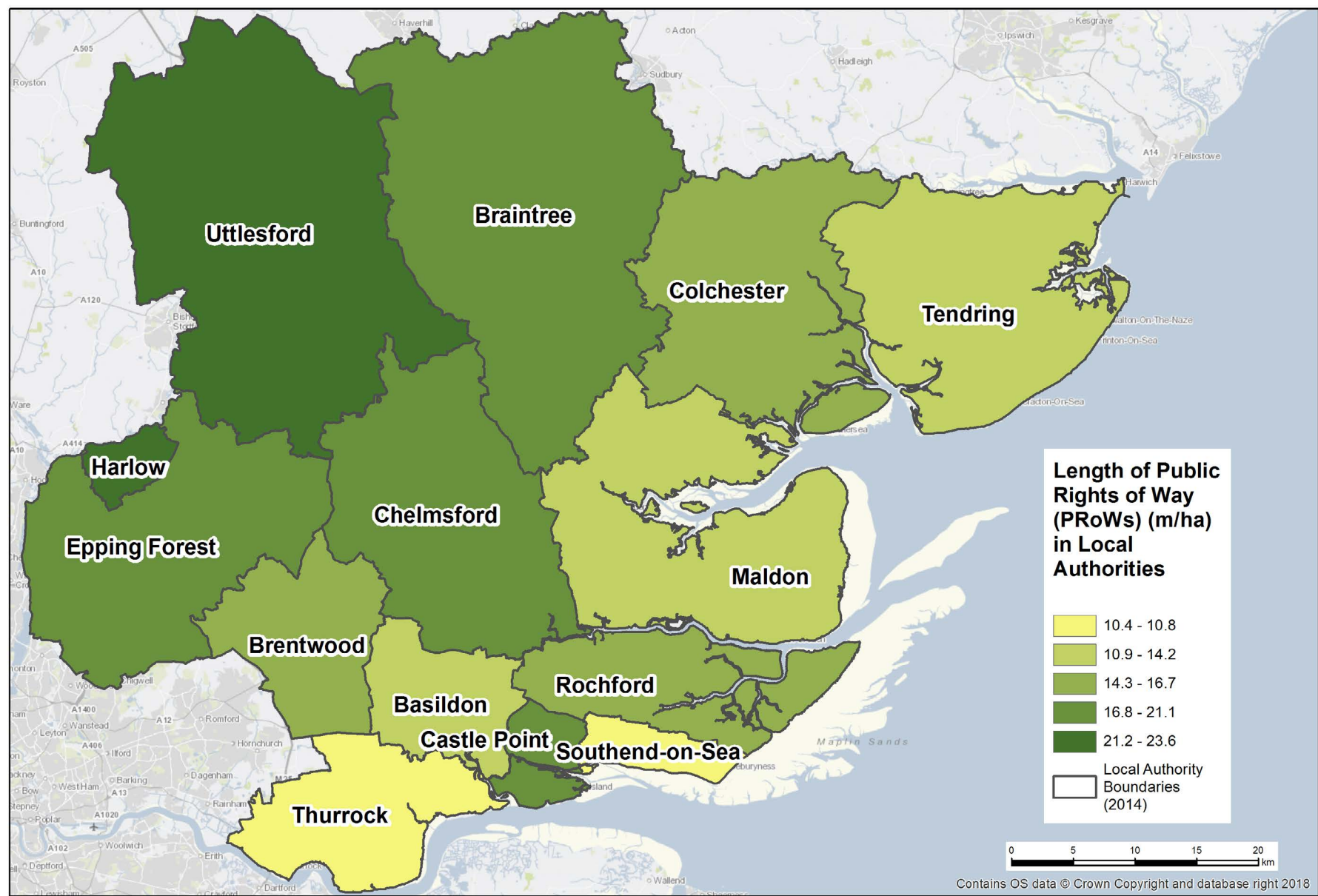
Appendix B13 - Potential Funding Sources

Table 7: Potential Funding Sources available

Potential funding sources	
The National Lottery	• Big Lottery funding is for community projects including purchasing and creation on public open spaces. • Heritage Lottery funding is to be used to conserve and enhance heritage assets including nature reserves and parks. Capital and Revenue
EU Funds	• Member States currently have the opportunity to support green infrastructure through programs integrated into their development strategies and co-financed from the Structural Funds (the European Regional Development Fund (Chapter 4) and European Social Fund), the Cohesion Fund, the European Agricultural Fund for Rural Development, LIFE+ and the research funding programmes. Capital and revenue
Natural England	• Countryside Stewardship grants - Funding for farmers, woodland owners, foresters and land managers to make environmental improvements. • Work is underway on the England Coast Path - a new National Trail around all of England's coast, which is 100% funded by Natural England.
Landfill Tax	• The Landfill Communities Fund (LCF) is an innovative tax credit scheme, which 'offsets' some of the negative impacts of living in the vicinity of a landfill site for affected communities. A proportion of the Landfill Tax liability is paid to not-for-profit organisations which deliver projects for the benefit of communities and the environment near a landfill site. The LCF is regulated by ENTRUST on behalf of HM Revenue & Customs, and the projects are delivered by enrolled Environmental bodies.
Landfill restoration programmes	• The restoration programs will create multi-benefit green infrastructure opportunities, such as the Pitsea Landfill restoration of 3.7km² in 2023, which will create another huge area of green infrastructure in South Essex.
S106	• Funding must be fundamentally linked to the development.
Community Infrastructure Levy	• Funding a wide range of infrastructure that is needed because of development and to provide wider benefits. This can include flood defences, parks and green spaces.
Countryside Stewardship	• Countryside Stewardship offers were introduced to help more farmers and land managers protect wildlife and enhance the environment. Each offer has a set of options and minimum requirements to meet to be eligible for funding for a 5-year agreement. https://www.gov.uk/government/collections/wildlife-offers-countryside-stewardship
Capital Programme	• The capital programme for Essex County Council identifies agreed capital schemes, such as Highways and school improvements, showing the total cost and the projected phasing of those schemes over current and future financial years. An opportunity to coordinate and incorporate green infrastructure as part of an existing schemes. Such as highways scheme to lower pollution like the A127 study which is providing cycleway infrastructure which is often also green infrastructure.

Potential funding sources

Private Sponsorship	• Corporate sponsors and private donors from local Business looking to enhance their green credentials.
Charitable Trust	• Community grants must be a community-led project. A charitable trust may provide funding and management for green space. These are not for profit organisations owning or leasing land or property in trust for the community.
Flood defence funding	• Environment Agency's flood and coastal defence funding: for risk management authorities. Local authorities can apply for grant for capital investment from the EA to create new or improved flood risk and coastal erosion management infrastructure and tackle groundwater and surface water issues.
Natural Flood Management Fund	• Defra announced £15 million of government funding for natural flood management schemes across England. The Environment Agency, Natural England and Forestry Commission, identified a number of projects at a catchment or coastal zone scale, and following consultation with the Flood Minister, have allocated funding to 24 projects. £1m of funding was also set aside for an 'open competition' for community projects.

Love Every Drop/ Make Rain Happy	• Love Every Drop is Anglian Water's strategy to put water at the heart of a whole new way of living.
	• Make Rain Happy will be at the forefront of their 25-year plan to manage surface water more effectively and sustainably. This includes:
	   • Disconnect 1 million downspouts
	   • Plant 1 million street trees, shrubs and plants, in collaboration with partners
	   • Educate 500,000 school children and fit SuDS to every school across our region
	   • Provide funding to local communities to manage surface water sustainably
	   • Ensure our own buildings and land manage surface water sustainably
	   • Significantly reduce the cost of SuDS delivery.

Future High Street Fund	• This fund will support, and fund local areas' plans to make their high streets and town centres fit for the future.
Partnership	• Working with Parish and Town Councils to ensure that green infrastructure assets are managed and maintained to ensure their continued functioning and use; and/or establish "friends of" schemes to manage and maintain community green infrastructure assets such as the Flitch Way Group.
Community Partnership	• The importance of community action in taking forward individual projects on sites in their local area will be encouraged. There are sources of public sector funding available if the project is community-led. • Ideas include: Grow your own scheme, "Friends of "Schemes, "The Greening Permit" – to deliver a similar scheme as in Paris. Support communities to come up with their own vision and plan for a public space not maintained as green space. To pursue a project, you must gain prior authorisation through 3 year (that can be extended to 12 year) permits applied for on line (TGIC, 2017).

Potential funding sources

Lee Valley Regional Park Authority's Community Access Fund	• Lee Valley Transport Bursary for schools - There is funding available for schools and education groups that require additional financial support for transport costs.
Social Prescribing	• Social prescribing schemes across England to receive £4.5 million. The funding will allow GPs to refer more patients to social activities and other types of support to improve health and wellbeing and reduce demand on NHS services.
Out Source	• Setting up organised programmes of activities commissioned from other service providers (i.e. health and Active Essex) that would help deliver management and maintenance over an agreed time frame. • Active Essex has won £10 million for the Essex Local Delivery Pilot from government to enable local communities to access sport and other activities using local facilities, including green infrastructure.
RAMS – Recreational disturbance Avoidance & Mitigation Strategy	• There are ten international and nationally important sites for wildlife on the Essex Coast designated under the UK Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations') – these include Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar site. Birds, other coastal species and habitats can be vulnerable to disturbance from recreation so there is the potential for conflict with people. A significant amount of housing is being proposed by the Essex Local Plans and Natural England advised that this, 'in combination' with other plans and projects to increase recreational activity in or near the Essex coast. Local Planning Authorities have therefore worked together to prepare a strategic solution which supports their Local Plans. • • The Essex Coast Recreational disturbance Avoidance & Mitigation Strategy (RAMS) aims to deliver the mitigation necessary to avoid significant adverse effects from 'in-combination' impacts of residential development that is anticipated across Essex; thus protecting the Habitats (European) sites on the Essex coast from adverse effect on site integrity. All new residential developments within the evidenced Zone of Influence where there is a net increase in dwelling numbers are included in the Essex Coast RAMS. The Essex Coast RAMS identifies a detailed programme of strategic mitigation measures which are to be funded by developer contributions from residential development schemes. The RAMS strategy also identifies priorities and the governance for its implementation, led by Chelmsford City Council, and has already started to generate financial contributions from new residential development within the ZOI to help deliver mitigation projects at the coastal Habitats sites. A per dwelling tariff has been calculated to be paid on commencement of the development. Funds collected will be used to deliver the agreed mitigation measures. The delivery of the Essex Coast RAMS will be under the banner of Bird Aware Essex Coast which aims to be more understandable to everyone
Other	• Generating income from existing and adding additional value to green infrastructure assets.

This information is issued by

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