

Essex Green Infrastructure

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Adaptation & Mitigation

21 November 2022



Agenda

- 1 **The Climate Challenge**
- 2 **Landscape Challenge**
- 3 **Delivering Change:
Planning & Development**
- 4 **Delivering Change:
Flooding & SUDs**

- 5 **Delivering Change: Tree
Planting**
- 6 **Delivering Change Faster:
Climate Focus Area**
- 7 **Green Infrastructure &
Health**

Climate Challenge: Greenhouse Gas Emissions

UK Domestic Green House Gas Emissions (GHG) by Sector 2019

Source: BEIS, HMG



Others include Public, Industrial Processes and the Land Use, Land Use Change and Forestry (LULUCF) sectors. The percentages may not sum to 100% due to rounding.

[Final UK greenhouse gas emissions national statistics: 1990 to 2019 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2019)

Under Climate Change Act 2008 we are legally required to achieve net zero green house gas emissions by 2050.

Government has agreed milestone in law of 78% reduction by 2035. Chancellor underlined commitment to targets UK agreed to as part of Glasgow Climate Pact: 68% reduction by 2030

Transport is the largest contributor of green house gases in the UK, but is an even larger share of Essex emissions.

Our built environment is in line with the national average.

Agriculture contributes 10% of emissions and must meet these targets like all other sectors.
How we grow food needs to change.

Climate Challenge: Our changing climate

LANDSCAPE UNDER THREAT

In 2021 UK Committee of Climate Change identified risks facing the UK from our already changing climate.

The gap between the level of risk we face and the level of adaptation underway has widened. Adaptation action has failed to keep pace with the worsening reality of climate risk.

The Committee identifies eight risk areas that require the most urgent attention in the next two years: five of these relate to destruction of our landscape and food production.

We need to change how we use and manage our land.

[Sector Briefings - UK Climate Risk](#)

Figure 1 Highest priorities for further adaptation in the next two years



Source: CCC

Notes: Figure shows the changing magnitude over time of the risk areas that require the most urgent action in the next two years. Change in magnitude is shown up to 2100 for the highest scenario assessed in the Technical Report for the relevant risks for that theme. Details are set out in an accompanying Annex to this report.

Climate has already changed IN ESSEX temperature and sea level are already rising

What has happened so far?



Global average surface temperature is more than 1°C above pre-industrial levels.



UK annual average temperature is about 1.2°C above pre-industrial levels. We have experienced a 0.8°C increase since 1961-1990.



Global mean sea level has risen $\sim 21\text{cm}$ from 1900.



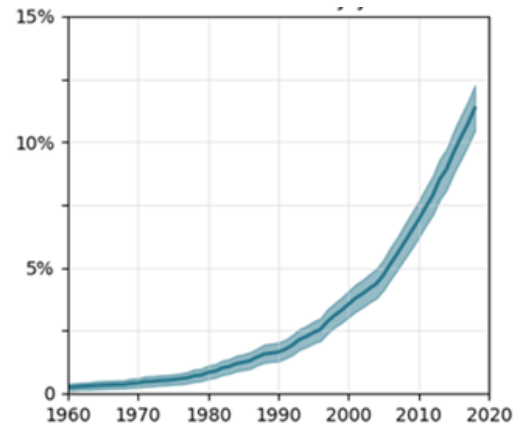
UK mean sea level has risen $\sim 16\text{cm}$ from 1900.



Indications of **increasing heavy rainfall** in the UK, though difficult to quantify.



Increasing chance of UK heatwaves “like 2018 summer”. Now 10-25% chance each year, compared to $<10\%$ chance a few decades ago.



Chance of a UK “2018 Summer” increasing annually since 1960.

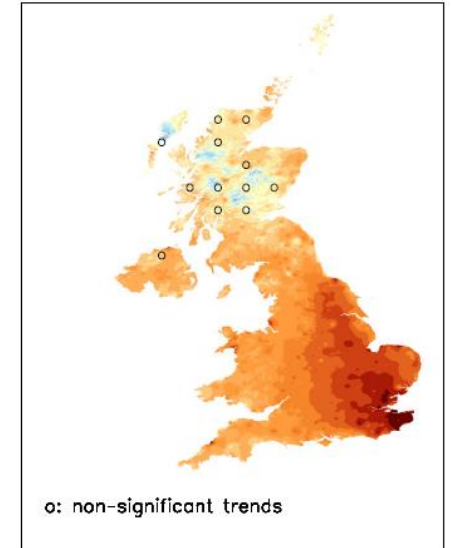
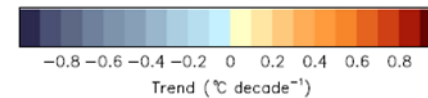
Chance >2018 by year

From the Met Office ‘UNSEEN’ project

Trend in the warmest day since 1960.

1960-2019 observed trends

Christidis et al. (2020)



Impacts agricultural productivity:

- vegetable shortages of early 2017, for example, were the result of climatic shocks to the food system
- in hot dry summer of 2018, UK carrot yields were reportedly down 25-30% and onion yields down 40% on a normal year.

Coastal Flooding & Erosion

The areas in Essex that could be underwater by 2050 thanks to climate change and what scientists say

There will be dramatic changes in Essex because of climate change



By [Louise Lazell](#) Senior Reporter
12:51, 21 JAN 2020 | UPDATED 07:52, 22 JAN 2020

▶ Enter your postcode for local news and info

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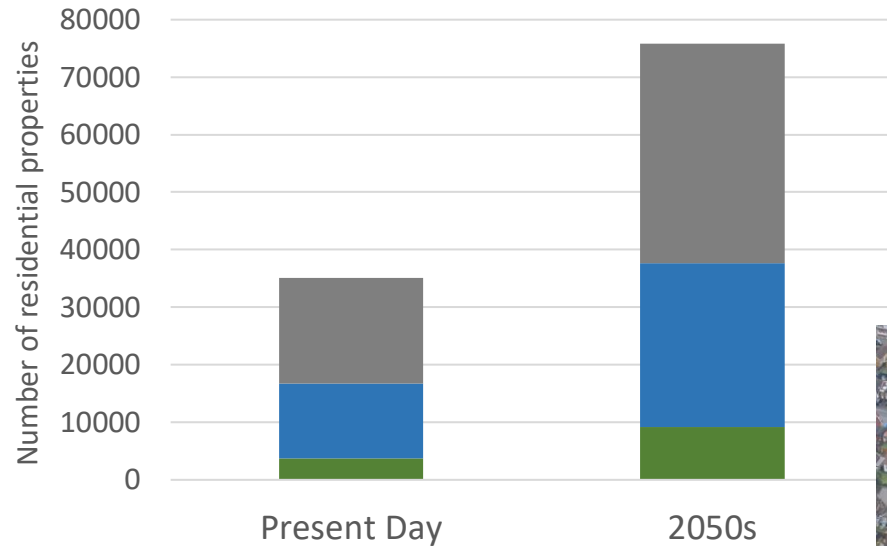


Cliffs at Cudmore Grove on Mersea Island are slowly being worn away.

[Climate Central](#) forecast huge swathes of the Essex coast below sea level by 2050.

Local impacts: Increased flooding & water scarcity

Residential properties at significant flood risk in Essex, Norfolk and Suffolk



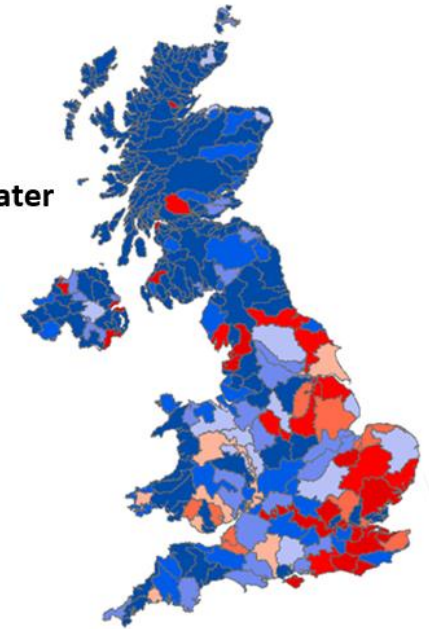
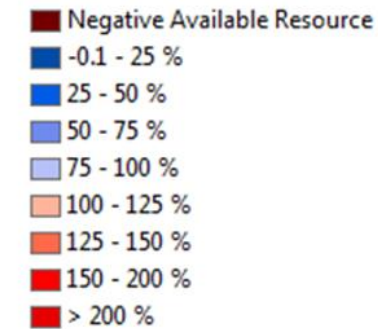
The number of homes at risk of surface flooding in Essex is expected to double between now and 2050.

Sayers et al. 2017 (CCRA2)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/300332/04-947-flooding-summary.pdf



Water demand as a % of water available for abstraction



The whole of eastern England is now classified as seriously water stressed – there is a water crisis

(Water Resources East, Jan 2022)



Essex Pressures

A MULTI-SECTOR, REGIONAL SCALE PLANNING PROBLEM

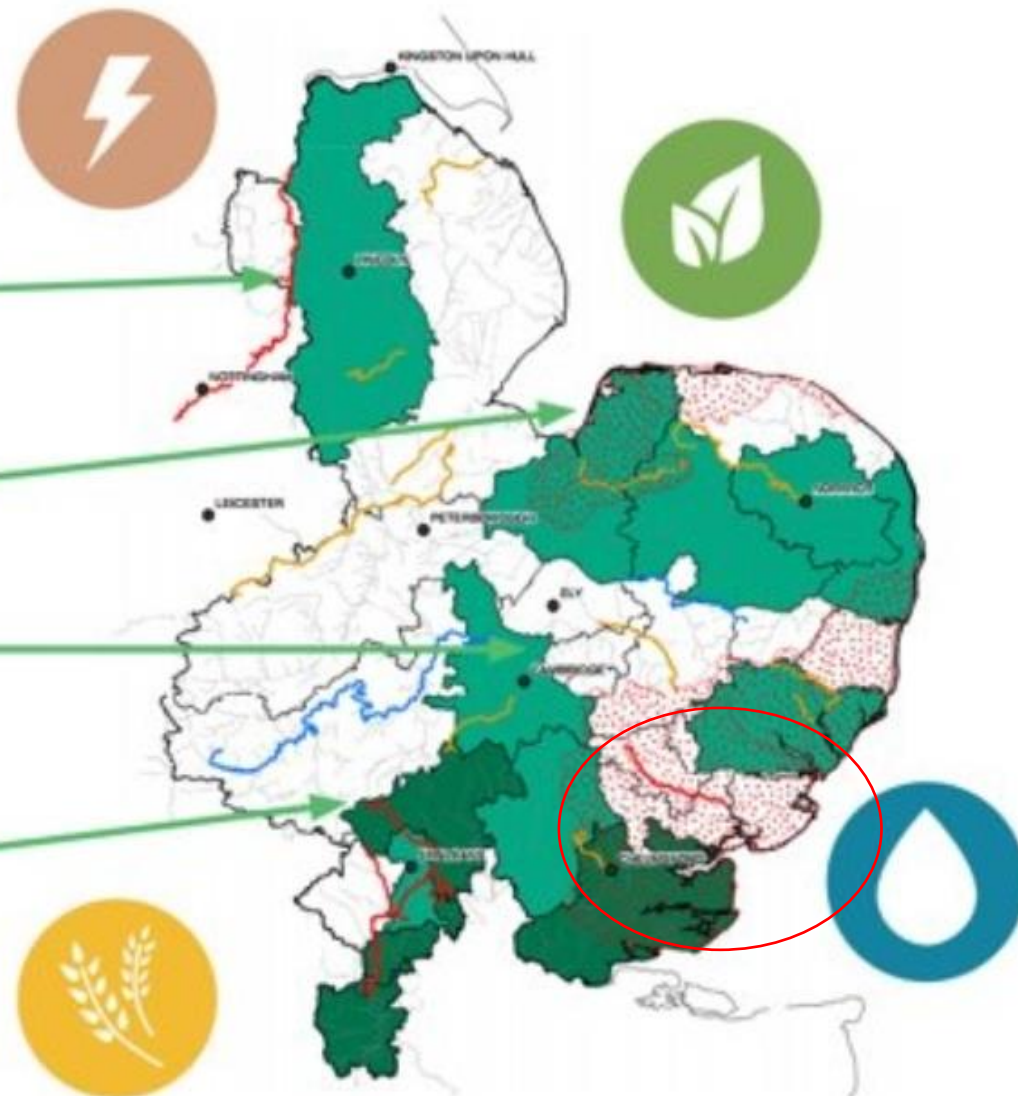
By the 2060's, the gap between the supply and demand for water will be at least 750MI/d. In the more severe scenarios that have been modelled, it is bigger. These estimates assume that levels of household demand are sustainable.

In scenarios with uncontrolled household demand there is widespread, catastrophic, failure of the WRE water resource and water supply systems.

Power and public water supply vulnerabilities combine on the Trent

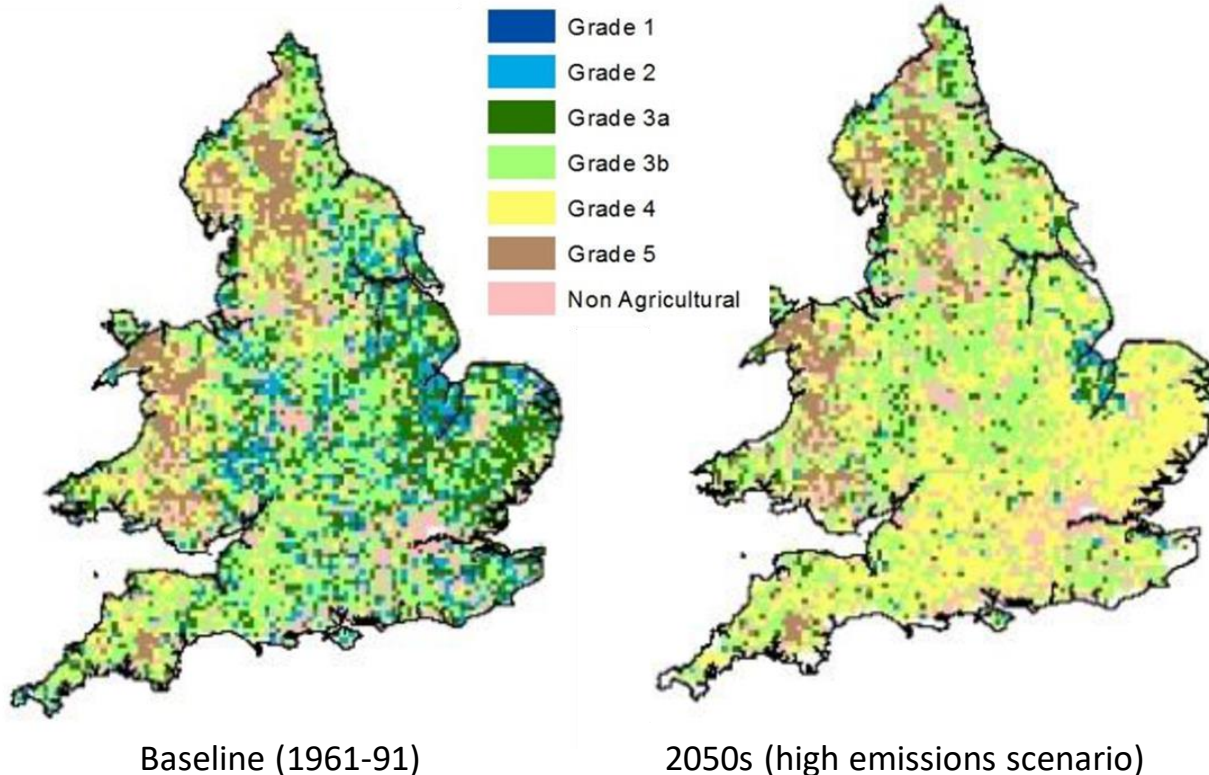
Public water supply, agriculture and environmental vulnerabilities combine in North Norfolk, Suffolk and Essex

Public water supply and environmental vulnerabilities combine in Cambridgeshire, the Vale of St Albans and the southern Chilterns



Local impacts: Agriculture, Soil & Subsidence

AGRICULTURAL LAND CLASSIFICATION IN ENGLAND AND WALES



Agriculture

Climate change will cause soil erosion – soil washed away in heavy rainfall in winter and blown away in drier summers - leading to **degradation of our agricultural land** and impacting our farming economy.

Subsidence Risk for Buildings & Roads

Climate change leading to hotter, drier summers, shrinks and cracks ground under houses. British Geological Survey reports *risks of clay related subsidence increases by a third by 2030 and triples by 2050*.

This means the 1m homes at risk in the UK in 1990 is set to rise to 2.4m by 2030. Essex is one of the key areas that will be affected.

How can We Adapt and Reduce our Risks?

Natural Green Infrastructure!

What Is Green Infrastructure? Green infrastructure is a strategic, planned network of natural, semi-natural and artificial plant and water components, designed and managed to deliver a wide range of 'ecosystem services' (benefits to environment and people) and quality of life benefits.

Land set aside for green infrastructure means:

- trees, meadows, salt marsh in rural areas
- trees, sustainable drainage and pocket parks in towns and villages.

Increasing green infrastructure

1) Absorbs carbon

2) Builds climate resilience:

- Enables the land to absorb water in winter and hold it in the landscape until it is needed rather than run off
- Reducing run off means, reduced flooding, reduced sewage overflows and pollution running into our rivers and seas.
- Provides shade against overheating in the summer

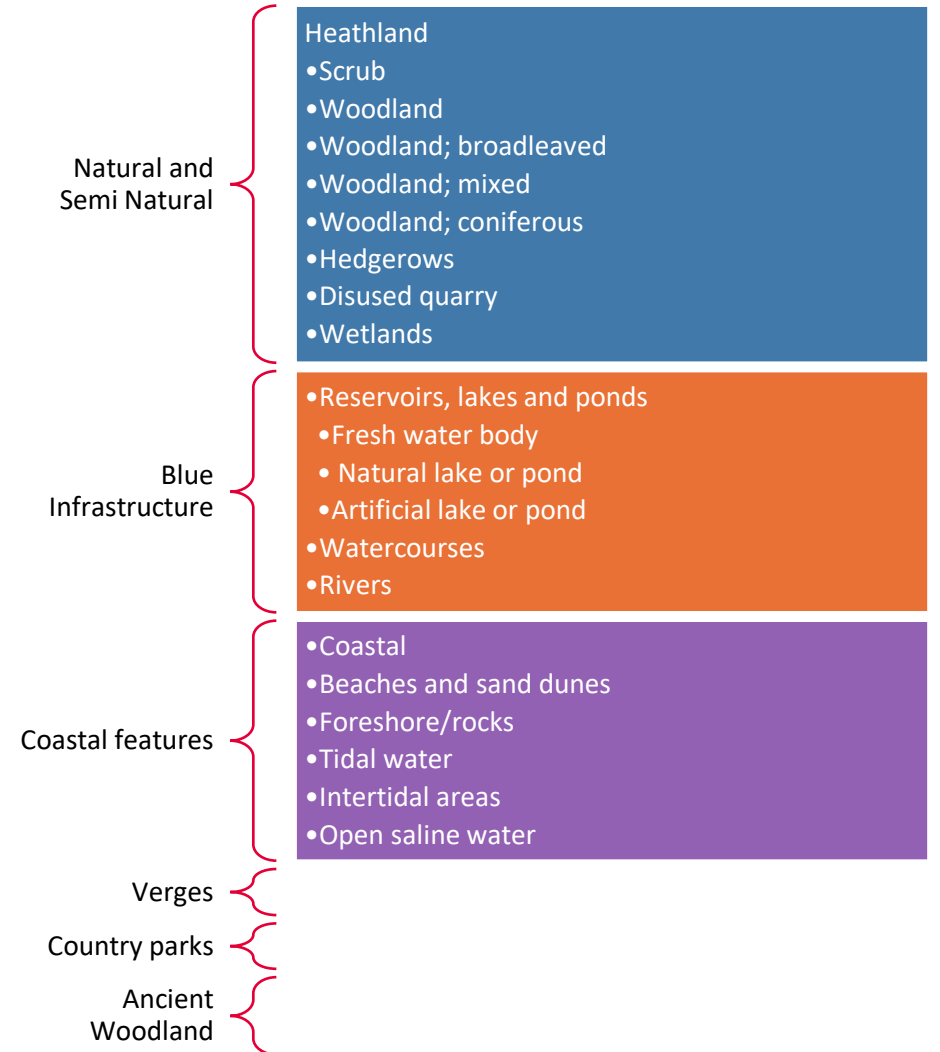
3) Provides habitat to support nature recovery

- Improves water quality
- Greenspace for physical and mental health for people, space for wildlife, critical space for pollinators.

4) Protects viability of farming and food production

- reduced soil loss
- Space for pollinators

Natural Green Infrastructure includes:



Landscape Challenge: Government Action

UK Action to protect our Landscape

UK Environment Act creates a legal framework for delivery of the 25 year Environment Plan

- Targets for clean air
- Targets for clean water and to manage sustainably
- Tree, Peat & Pollinator Strategies
- Targets for Soil Health
- Increased area of protected habitat, and to be kept in a favourable condition: creating or restoring 500,000 hectares of wildlife-rich habitat outside protected sites as part of a Nature Recovery Network.
- County Councils must produce a **Local Nature Recovery Strategy**.

[Get in on the Act: The Environment Act 2021 | Local Government Association](#)

Bio- Diversity Net-Gain

Developers will have to assess the value of a site to wildlife and aim for a net gain i.e. an improvement for wildlife

Developers must

- Avoid negative impacts e.g. avoid areas of ecological interest
- Reduce negative impacts to ensure ecological value of the site is maintained
- Pay compensation for measures on or outside the site to ensure no residual harm to wild life (off-setting)

[Biodiversity metric: calculate the biodiversity net gain of a project or development - GOV.UK \(www.gov.uk\)](#)

Sustainable Food Production

Environmental Land Management

New subsidy for farmers promoting

- **sustainable farming**: to manage their land in an environmentally sustainable way e.g. regenerative agriculture with good soil health, no till and low inputs
- **local nature recovery**: to support local nature recovery and meet local environmental priorities e.g. hedgerows, grasslands,
- **landscape recovery**: support landscape and ecosystem recovery e.g. large scale tree planting, peat and march restoration

Farmers can therefore be paid for delivering clean and plentiful water, clean air, thriving plants and wildlife, protection from environmental hazards, reduction of and adaptation to climate change, beauty, heritage and engagement with the environment

[Environmental land management schemes: overview - GOV.UK \(www.gov.uk\)](#)

Woodland Carbon Guarantee

Woodland creation projects are reward for the carbon they are absorbing. Schemes register under scheme and sell carbon units to the Government every 5 or 10 years for a guaranteed price, index linked for the life of the contract or holders can sell on the open market.

[Woodland Carbon Guarantee - GOV.UK \(www.gov.uk\)](#)

Everyone's Essex

- Four strategic aims – and 20 commitments that we will deliver:



Everyone's Essex online

<https://www.essex.gov.uk/everyones-essex-our-plan-for-essex-2021-2025>

Everyone's Essex video

<https://www.youtube.com/watch?v=kbKTCIKtSNo>

Essex Climate Action Commission
Powering positive change



Net Zero: Making Essex Carbon Neutral

Essex Climate
Action Commission



2021 EV strategy; E-Scooter Pilots running;
Ten Liveable Neighbourhoods
Community owned renewables
Essex Design Guide; Green construction training
Smart meters in schools
All new builds to have solar panels

2022 New schools commissioned net zero
25 school streets
10 local delivery hubs
5 E-cargo bike schemes
Energy sector innovation hub

2024 Network community reuse
and repair hubs

2023 Essex Housing Demonstrator net zero development
Developers to fund flood risk management via CIL
Coastal flood resilience scheme in critical areas completed

2025 All New buildings net zero and support circular
economy recycling
50% Essex schools retrofitted to net zero
All residents & businesses to have kerbside recycling
All biodegradable waste to beneficial use

2030 25% all roofs have solar panels
1.43GW solar energy
Bioenergy in difficult rural homes
Hydrogen store for renewable energy
20 Liveable Neighbourhoods
3 new park and choose sites

2030 All public sector estates in Essex NetZero
100% fuel poor homes retrofitted & supplied
with renewables
2/3 Essex houses retrofitted
1/3 commercial buildings retrofitted
100% schools retrofitted
All new buildings carbon positive

2030 25% land natural green infrastructure
(urban and rural)
50% farmland uses sustainable land stewardship
30% Essex in a Climate Focus Area
Per capita waste reduced by 10%
70% recycling rate
Zero waste to landfill

2035 All waste heat reused
All gas fired power repurposed to bioenergy
Network of community energy neighbourhoods
in every district

2040 All housing retrofitted
Zero GHG emissions from housing
Essex renewables meets all county needs
30% all land natural green infrastructure
75% farm land adopts sustainable
land practises

2050 All roofs have solar panels
75% all developments have integrated natural water management
100% farm land uses sustainable land practises

Net Zero: Making Essex Carbon Neutral
can be found [here](https://www.essexclimate.org.uk)

ECAC website www.essexclimate.org.uk

Essex Climate Action Commission

Land Use & Green Infrastructure Recommendations

RECOMMENDATION 1	Farmland in Essex adopt Sustainable Land Stewardship practices
RECOMMENDATION 2	30% of all Land in Essex will enhance biodiversity and the natural environment by creating Natural GI
RECOMMENDATION 3	Develop schemes to increase flood resilience
RECOMMENDATION 4	30% greening of our towns, villages and new developments
RECOMMENDATION 5	Create a Climate Focus Area
RECOMMENDATION 6	Ensure collaboration & engagement by carrying out a participatory community process
RECOMMENDATION 7	Developing Effective Monitoring & Evaluation; Integrated Sustainability Appraisal Framework; Knowledge and Decision Support Framework; Essex Climate Observatory.
RECOMMENDATION 8	Develop a Funding and Partnership development Programme

Local Nature Partnership

Chair: Dr Simon Lyster

Board

ECC, Thurrock Council, Essex Planning Officers Assoc, Essex Developers Forum, Essex Wildlife Trust, Whirledge & Nott, Environment Agency, Natural England, Rural Community Council of Essex, Young Essex Assembly, Essex Cultural Diversity Project, Ground Control

Set up March 2022



Targets by 2030



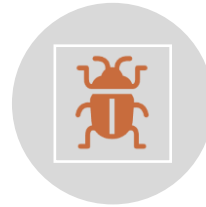
50% SUSTAINABLE
FARMING BY 2030



INCREASE NATURAL GREEN
INFRASTRUCTURE FROM
14% TO 25% BT 2030



1 IN 4 PEOPLE TAKING
ACTION FOR WILDLIFE
(ADOPTED FROM ESSEX
WILDLIFE TRUST)



ACCESS TO HIGH QUALITY
GREEN SPACE FOR ALL

Four working groups

1. Local Nature Recovery Strategy
 - Awaiting Guidance from Defra
 - Aims to map network of nature corridors
2. Planning and Biodiversity Net gain
 - Aim to drive collaboration on investment of BNG funds
 - Could support delivery of LNRS
3. Community Engagement
 - A lot of support and engagement form community
 - Resident survey supports increased GI
4. Agriculture
 - Engaging with farmers to support move to sustainable farming and investment in nature

Essex's £200m climate action plan is unveiled



Essex Climate Action

- [Essex Climate Action Plan](#)
- [Annual Climate Report 21/22](#)

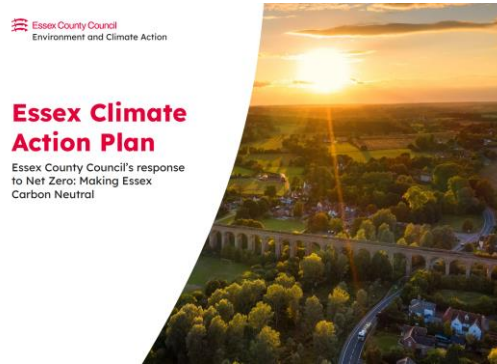
ECC has accepted the Commission recommendations

In Nov 2021 ECC launched the Essex Climate Action Plan: £200m over 4 years to work with partners to put us on the path to a more resilient low carbon county.

This includes work on land use and green infrastructure including

- nature based flood resilience
- sustainable drainage
- local nature recovery
- supporting sustainable farming
- increasing green infrastructure including the Essex Forest Initiative

The Essex Strategies Supporting Climate Resilient Landscape Change



Essex Climate Action Plan

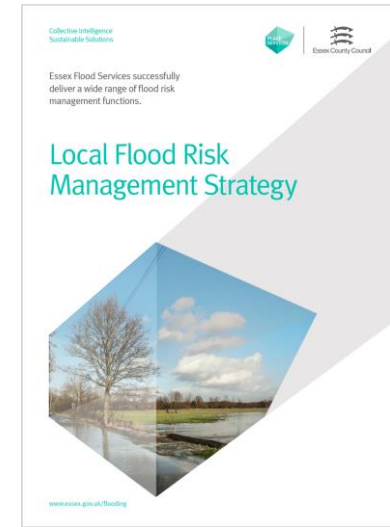


Essex Green Infrastructure Strategy

Award winning strategy:



The Nature Recovery Strategy
In development with the Local
Nature Partnership
Due for Publication 2023
Awaiting Guidance from Defra



ECC is Lead Local Flood
Authority & prepares the
Local Flood Risk Strategy



Essex Water Strategy
In development, building on regional
Water Resources East plan
Due for Publication 2023

Delivering Change: Planning and Development

Essex Green Infrastructure Standards Guidance Published 2022



The guidance provides

- Guidance for planners and developers
- Aligns with National Green Infrastructure Framework and Building with Nature
- Awaiting Building With Nature Accreditation

Sustainable Drainage (SuDS) Planning Advice

SuDS are natural drainage systems managing surface water using green infrastructure rather than by conventional drainage such as pipes and tanks, improving water quality, amenity & biodiversity as well as flood mitigation

ECC provides advice on any planning Application with:

- 10 or more houses
- Development over 0.5 ha
- Site over 1 ha
- Buildings over 1000m²

The [SuDS team](#) have managed

- 850 planning applications
- improving flood resistance on c. 62,500 properties

With aspirations to deliver around 140,000 additional homes across Essex up to 2036, 'new development' must be environmentally sustainable and SuDS play a key role in mitigating the negative impacts, so need to be adopted and maintained in perpetuity



Delivering Change: Flood Resilience

The award winning floods programme has been running since 2015.

ECC has invested £12m and secured £9m grant funding.

We now target 50% match funding for all our investments in flood resilience.

Projects are increasingly nature based such as **East of Guilfords Road, Old Harlow.**

- a landscaped basin with a preferential overflow from Harlowbury Brook, during times of extreme rainfall, the water flows into the basin and is stored temporarily. As a result, 47 properties within the Old Harlow Critical Drainage Area (CDA) will be protected from a 1% AEP flood event when compared to a do nothing scenario
- The proposals also include biodiversity and amenity enhancements for the area of open space.

Guilfords Flood Alleviation Scheme, Old Harlow.



Visualisation with and without water being stored evidencing the multifunctionality of the scheme

Delivering Change: Flood Resilience & SUDs

Raingardens Retrofit for Cardiothoracic Centre Courtyards at Basildon University Hospital

© Photos: Essex County Council



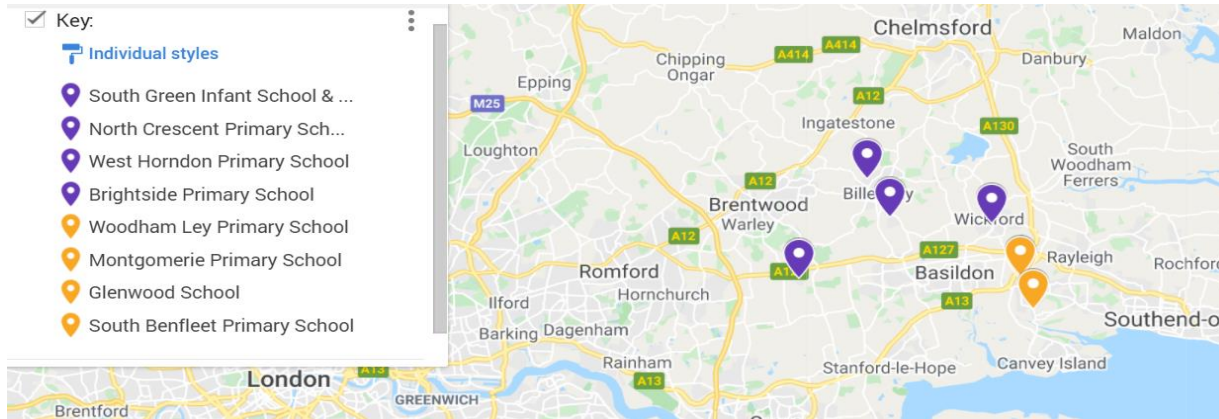
[Make Rain Happy](#)
Canvey Island

Leaky Dams in Kingswood



Delivering Change: Flood Resilience & SUDs

East Essex Schools



£400k Scheme: Grant Funded

- £250k DfE
- £121k ECC
- £30k Anglian Water

8 schools – located in east of Essex (Billericay, Basildon, Brentwood, Benfleet)

8 schools have been approached with very positive responses. We now have outline designs for the programme at each school. Delivery May 2022- May 2024.

West Horndon Primary School



Following engagement with the school it is evident that the area in blue is worst effected by flood

- Highest priority is to put in a swale to capture the large amounts of water
- Planters and green garden are secondary priority to be decided on after detailed design has been done

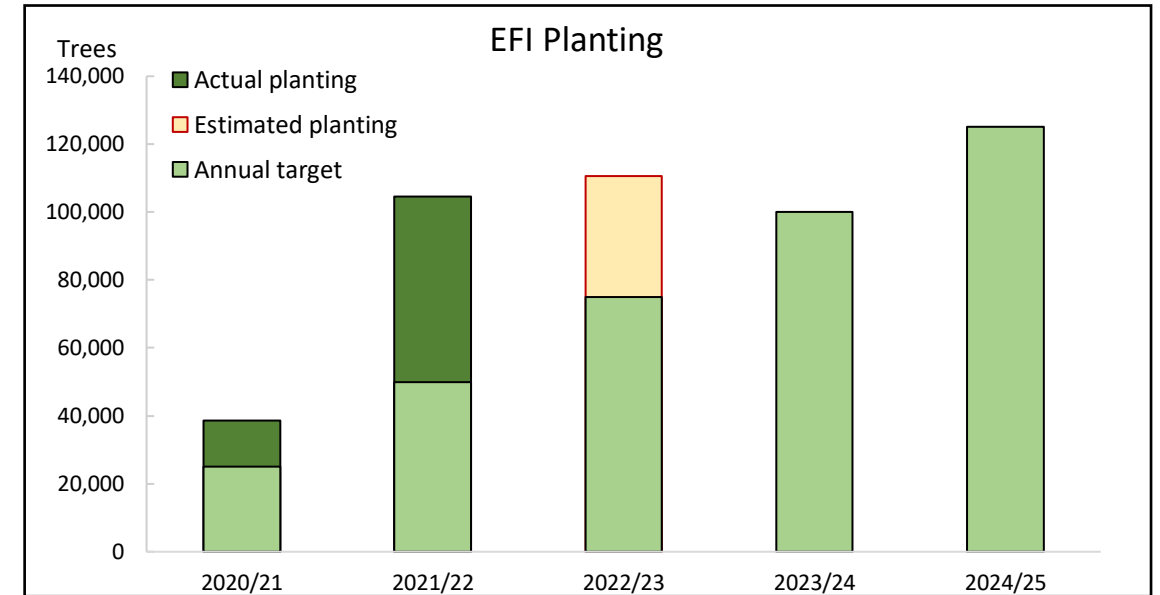


Delivering Change: Tree Planting Essex Forest Initiative

Funding Offer for Tree Planting for Any Plot, Any Landowner

Tree planting in every District, Borough & City across Essex

- **Grant funding from Urban Tree Challenge & LE Treescape Fund**
 - £806k in 22/23
 - £335k in 21/22
- **Volunteers**
 - 1164 volunteer hours so far this year
 - 20,000 trees being planted with the public
- **Exceeding Planting Targets Year on Year**
 - Year 1 (20/21) 38,615 against target of 25,000
 - Year 2 (21/22) 104,444 against target of 50,000
 - This year 110,577 against target of 75,000
- **Improvements**
 - Planting across all 12 districts
 - Bigger volunteer capacity
 - Dedicated planting team
 - Biodegradable tree guards
 - Organic, low carbon footprint mulch
 - Narrow planting window (November – December)
 - Mulching early after planting



Urban Tree Planting

More mature trees to increase flood resilience in urban settings.

Partnerships

- Forestry Commission
- Woodland Trust
- Lower Thames Crossing
- One-tree planted
- Conservation Volunteers



Delivering Change: Tree Planting

Essex Forest Partnership

- The Essex Forest Partnership was set up to share and coordinate tree planting targets across the County by each local authority.
- The EFP has regular meetings to share knowledge on tree planting achievements, barriers and to collaborate on common goals.
- Together, the EFP's ambition is to increase and improve green spaces in Essex, and scale up urban tree planting to absorb heat and pollution while benefiting local communities.

	Year 1	Year 2	Long term target
Essex County Council	38,615	50,000	375,000
Colchester Borough Council	10,500	13,000	200,000
Chelmsford City Council	15,000	16,500	175,000
Uttlesford District Council	85		90,000
Brentwood District Council	6,000		50,000
Harlow District Council	400	2,340	15,000
Basildon Borough Council	500	16,000	25,000
Tendring District Council	11,000		25,000
Epping Forest District Council	150	35,000	50,000
Castle Point Borough Council		6,000	25,000
Rochford District Council			5,000
Maldon District Council			5,000
Braintree District Council			5,000
TOTAL	82,250	168,812	1,045,000

Delivering Change Faster

Climate Focus Area

Location: Blackwater & Colne River Catchment

All farmland to adopt sustainable land stewardship practices

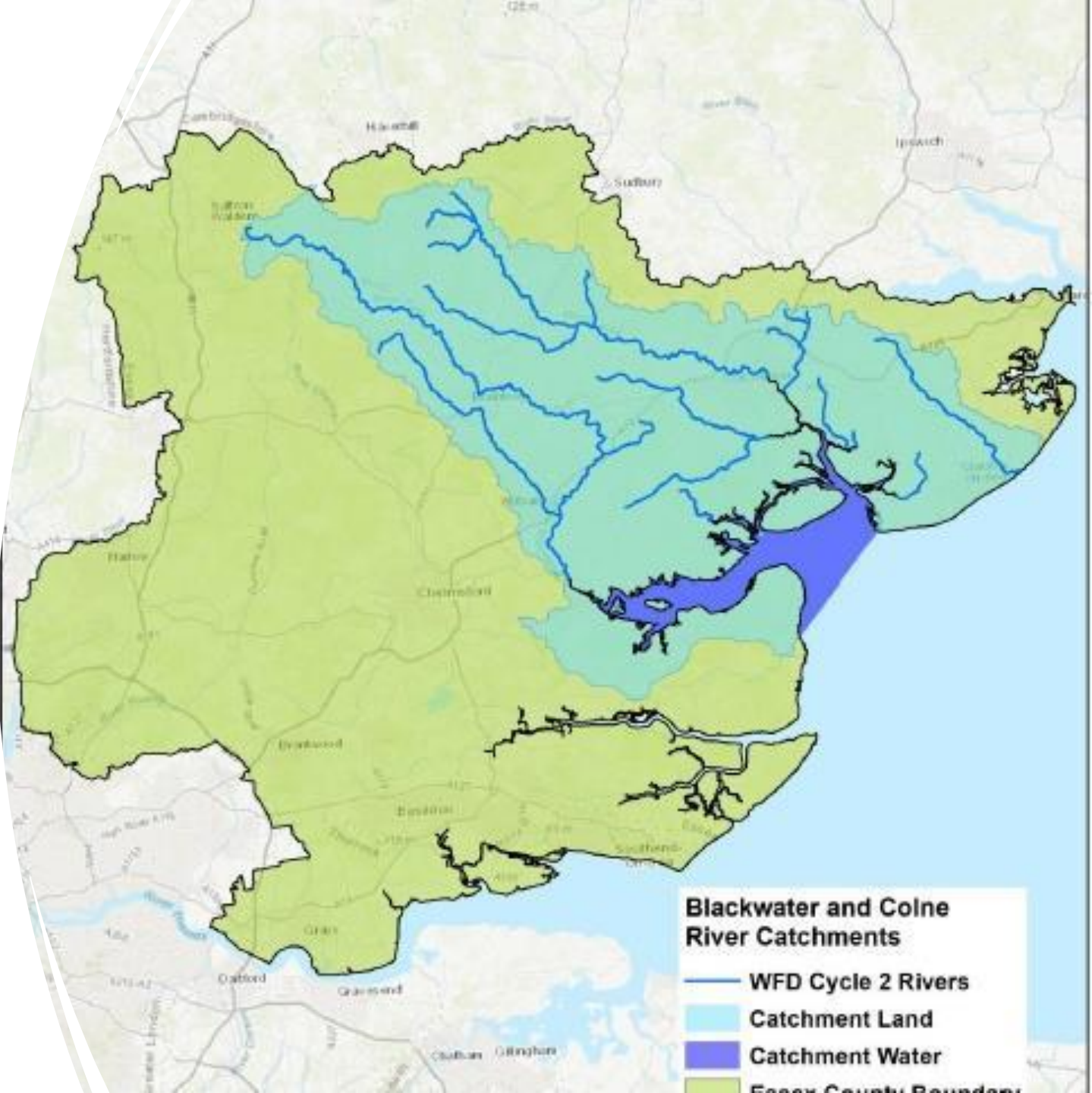
30% of land cover to be managed as Natural Green Infrastructure

30% of urban areas under Natural Green Infrastructure

Native tree cover to double (c.5% to 10% cover)

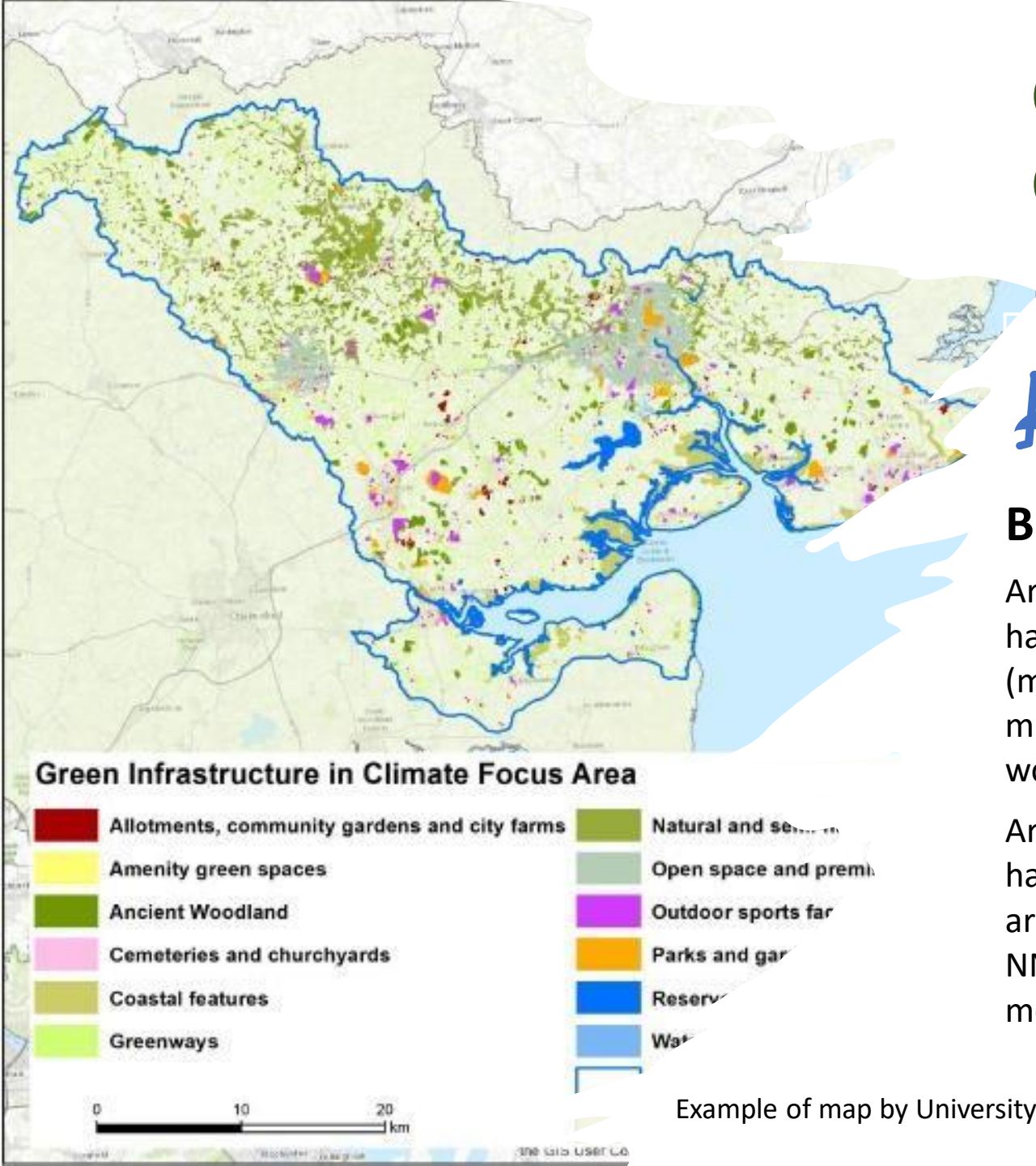
Every Parish to have a biodiversity action plan

Every Parish to have a climate emergency strategy



CFA BASELINE & MONITORING

CFA Mapping: Natural GI habitats



Baseline

Area and % area of natural GI/ habitats, with each measured (mudflats, marshes, wetlands, meadows, hedges, scrub and woodland).

Area and % area of Protected habitats. a. Existing protected areas, e.g., AONBs, SPAs, NNRs, SSSIs, LNRs etc will be measured in area and quality.



Opportunity

Opportunities for Habitat extensions or new creation on a local or district level

New habitats will be created, such as coastal habitats, marshlands, wetlands, meadows, hedgerows and woodlands to increase Biodiversity..

Example of map by University of East Anglia

Climate Focus Area Community

Stakeholder workshops run by Professor Peter Hobson (Writtle University College and Commissioner) & ECC:

- 57 individuals from around 40 organisations attended including parish councils, community groups, landowners, local authorities and government agencies
- Developed 38 project ideas and committed to working with their local communities to deliver these over the next year.



Climate Focus Area

Farmers

North Essex Farm Cluster is newly formed & coordinated by Joe & Emma Gray of JE Tabor Farms, on their family farm at Bovingdon Farm:

The Cluster is a forum to meet other farmers in our area, and involves landowners and farmers working together to discuss farming for nature, exchange knowledge and experience, and deliver nature-based projects.

Members share knowledge, work together to access funding and generating income from new private sector markets, such as carbon capture and biodiversity net gain.

The Farm Cluster approach is very much from the bottom up, which is why our coordinators are farmers themselves, with farmers and landowners forming the group and deciding their own aims and objectives.

[NORTH ESSEX FARM CLUSTER - Home \(weebly.com\)](https://www.northessexfarmcluster.co.uk/)



Funded By: Essex County Council, Environment Agency, Essex & Suffolk Water, Anglian Water and RSPB

Climate Focus Area

Investing in Sustainability

Natural Environment Investment Readiness Fund

- Essex County Council (ECC) has secured a grant of £98,495 DEFRA
- develop a business case to unlock private and public investment in green infrastructure in Essex.
- Consortium of partners is exploring new funding sources to restore woodland and meadows e.g.
 - woodland carbon units
 - Biodiversity Net gain
- Aim is that investment cases can be used as a blueprint for developing many more similar projects across Essex

Four Pilots Sites: 1500 hectares

- **Spains Hall Estate (Private land owner)**
- **Abbots Hall Farm (Essex Wildlife Trust)**
- **Braxted Park (Private land owner)**
- **Wildfell (Evergreen Trust)**



Beavers at
Spains Hall

Green Infrastructure & Health

Green infrastructure has a positive influence on population and individual level health and wellbeing.

Greenspace, such as parks, woodland, fields and allotments as well as natural elements including green walls, roofs and incidental vegetation, are increasingly being recognised as an important asset for supporting health and wellbeing.

Green environments

- promote and protect good health, and aid in recovery from illness and help with managing poor health.
- associated with better mental health including reduced levels of depression, anxiety, and fatigue, and enhanced quality of life for both children and adults
- can help to bind communities together, reduce loneliness, and mitigate the negative effects of air pollution, excessive noise, heat and flooding.

Disadvantaged groups appear to gain a larger health benefit and have reduced socioeconomic-related inequalities in health when living in greener communities

£2.1 billion per year could be saved in health costs if everyone in England had good access to greenspace, due to increased physical activity in those spaces

[Public Health England Improving Access to Greenspace 2020](#)



Public Health
England

Protecting and improving the nation's health

Improving access to greenspace
A new review for 2020



This information is issued by:
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