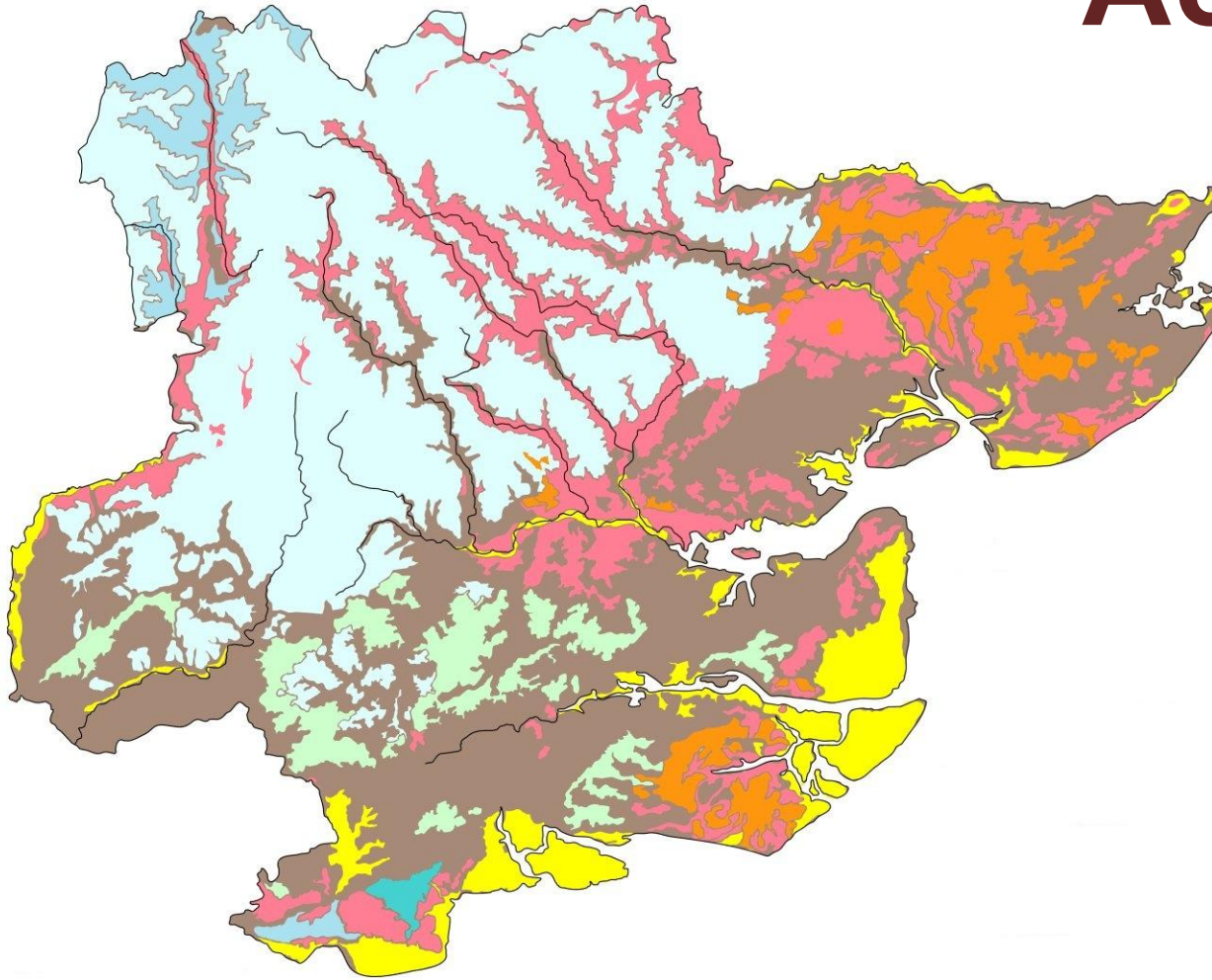


# Essex Local Geodiversity Action Plan



March 2013



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50 million year old shark teeth from the Naze cliffs

# What is Geodiversity?

Geodiversity has been defined as:

‘The natural range (diversity) of geological (rocks, minerals, fossils), geomorphological (landform and processes), and soil features. It includes their assemblages, relationships, properties, interpretations and systems’<sup>1</sup>.

1 Gray M. (2004) *Geodiversity: Valuing and conserving abiotic nature*, Wiley & Sons.



A disused gravel pit near Colchester providing visible evidence of the former route of the Thames through central Essex

# Why is it important?

Besides being a fascinating subject in its own right, Geodiversity is fundamental to so many aspects of human life and activity. It determines:

- The nature of our landscape and coast.
- The nature of our soils on which land use patterns and our agriculture depend.
- The nature of our biodiversity.
- Our hydrology.
- Much of our historical and present industrial development and resource exploitation, e.g. water supplies, brick clay, chalk for cement and agricultural lime, and sand and gravel.

Understanding our geodiversity is therefore key to a full appreciation of the services, both aesthetic and economic, that it provides, and also to ensuring that it is managed in a sustainable way.





# What is special about Essex Geodiversity?

Essex is an area of predominantly subdued relief with gentle slopes, the result of its underlying geology of soft, relatively young rocks at outcrop. These generally yield fertile soils. The result is an attractive “lived in” landscape dominated by arable agriculture, but still retaining forested and heathland areas, particularly where gravels and sands, many of glacial and fluvial origin, have yielded poorer soils.

Although lacking the more dramatic geology and landforms of many “hard rock” areas Essex geology and geomorphology is still of great interest, possessing abundant evidence of the huge environmental and biodiversity changes that our area has witnessed over the last 100 million years. Among the key themes are dramatic and sometimes long-lasting changes in the distribution of land and sea, major shifts in climate, and mass species extinctions. Many of these phenomena are of great relevance today, and so an understanding of our past is of assistance in interpreting the challenges to come.



Mammoth tooth from Canvey Island

# **Geodiversity's influence on Essex's development**

**Essex's geodiversity has exerted a major influence on land use, agriculture and landscape:**

- The distribution of less fertile high level river and glacial gravels has been a major influence on historical land use, resulting in the preservation through to the present day of extensive tracts of woodland and to a lesser extent heathland, in a predominantly arable county, e.g. in the Billericay and Danbury/Tiptree Ridge areas. These are of great significance both for biodiversity and recreation.**
- London Clay outcrops over much of the county, providing fertile soils for arable agriculture, especially wheat. The chalky till found in central and north Essex is also highly suitable for cereal cultivation.**
- Essex is a maritime county with the one of the longest coastlines in England. Our coastal geomorphology has exerted a major influence for millenia, both positive and negative.**
- In earlier times the low coastal relief and sheltered estuaries, penetrating deep inland, together with proximity to the Continent, provided a succession of invaders and colonisers - Roman, Viking and Saxon - with easy access. In modern times these same attributes have supported both our development as a key trading gateway to the**

**Continent and beyond, and as a major leisure area for water based sports. Two other long standing coastal industries are salt making and fishing.**

- **Our coastal geomorphology also presents us with a major challenge for the future – managing our coastline at a time of rising sea level and climate change and the resulting changes in the pattern of erosion and sediment deposition.**

**It has also provided a source of raw materials, some of which supported major industries, some now long forgotten:**

- **The deposits of the ancestral Thames and its tributaries have provided Essex with a source of gravel and sand for construction since Roman times. A special kind of gravel naturally cemented by iron, ferricrete, was used extensively as a building stone and is found in many medieval churches.**
- **The Chalk of S and NW Essex has been used extensively for cement manufacture, agricultural lime, and even toothpaste whitener. It was mined from deneholes in the medieval period and quarried in Thurrock from the 1500s, with 25 million tonnes being won from the Chafford group of quarries. It has also been used for repairing sea walls, ships' ballast, interior walls, and even decorative carving in N. Essex. The quarries left behind now form an important biodiversity and geodiversity asset, and one also exploited for major retail and residential developments.**

- **Flint from the Chalk has an even longer history, providing raw material for one of mankind's earliest industries – flint tool making. A Neanderthal working floor has been excavated at Chafford Hundred. In historical times flint has been extensively used as a building material, in pottery manufacture and for gunflints.**
- **Essex's plentiful supply of clay, both London Clay and Pleistocene brickearth and lake deposits, have supported brick and tile making in many areas, dating back to Roman times. Cistercian monks were making bricks at Coggeshall from the 1150s, and in the 1690s Daniel Defoe had a works at Tilbury making pantiles. Other notable centres were Ilford, Grays and Gt. Wakering, and to this day at Marks Tey and Bulmer. In the late 19<sup>th</sup> Century the clay was used for art pottery by Edward Bingham at Hedingham.**
- **Other materials found in the London Clay have also been important. Cement stones or septaria were used by the Romans to construct Colchester's town walls and buildings, and also the fort of Othona at Bradwell. Many medieval churches utilise septaria and in 1528 Cardinal Wolsey had them removed from the Harwich beach for his college at Ipswich. Later, in the 1790s, they were used for making hydraulic cement and between 1812 and 1845 several 100,000 tonnes were removed from the base of Beacon Cliff at Harwich. In 1848 between 200 and 300 boats were involved in dredging for it! Another valuable material from the London Clay was copperas stones (iron sulphide), collected at Walton, Frinton and Harwich from the 1600s and processed into ferrous sulphate for tanning at Brightlingsea, Walton and Ramsey.**



- **The Chalk provides us with an important source of water. Situated on the northern arm of the London Basin syncline, Essex is underlain by the Chalk aquifer, the most important in England. Essex and Suffolk Water started life in the 1860s as the Essex Waterworks Company, to exploit the high quality water flowing from this aquifer, where it reached the surface and flooded the chalk quarries in the Thurrock area.**
- **Water of another kind was important historically – “medicinal” mineral springs, e.g. at Wanstead from the early 1600s, growing to around 20 sites by the late 1700s.**



Limefields Chalk Pit in Saffron Walden.

A rare opportunity to see the foundations of the landscape in north-west Essex

# Geodiversity and National Policy

The importance of geodiversity as an integral part of nature conservation and the planning system is reflected in *The National Planning Policy Framework*, and in legislation – *Wildlife & Countryside Act 1981* and *Countryside and Rights of Way Act 2000*. The most important sites have been declared as SSSI's under statute (see Appendix 1 for a list of Essex geological SSSI's), with the next tier designated as LoGS (Local Geological Sites) replacing the earlier RIGS (Regionally Important Geological & Geomorphological Sites) terminology in line with government guidance.

Importantly the *Framework* gives local geological and geomorphological sites (LoGS) a weighting equal to local wildlife (species and habitats) sites (LoWS), although in actuality the attention and priority afforded to the designation and management of LoGS has historically lagged, and continues to lag well behind that of LoWS.

The NPPF states that (1) “the planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, geological conservation interests and soils”; (2) that “local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged”; and (3) “to minimise impacts on biodiversity and geodiversity, planning policies should aim to prevent harm to geological conservation interests”.

# The Essex Local Geodiversity Action Plan

## What is it?

The Essex LGAP is a document that defines the actions required to ensure that the county's geodiversity is recognised, valued and managed in a sustainable way.

It will achieve this by:

- Conducting an audit of all the county's geodiversity sites and identifying those that meet the criteria for citation as Local Geological Sites (LoGS) .
- Assisting planning authorities in meeting their obligations under the *National Policy Planning Framework* and helping them identify potential development impacts on LoGS.
- Communicating to non-specialists the importance, richness and fascinating history represented by our geodiversity.
- Identifying the management requirements for the conservation of LoGS.
- Seeking the funding and resources necessary to deliver the above plan elements.



# GeoEssex and the Essex LGAP

GeoEssex is a not-for-profit partnership open to all with an interest in our county's geodiversity. It comprises mainly volunteer geologists representing organisations in the county with an interest in geodiversity - Essex Field Club, Essex Wildlife Trust, East Anglia Branch of the Open University Geological Society and the Essex Rock and Mineral Society – together with representatives from Natural England and Essex County Council. It was formed in response to an initiative from Natural England following the recognition that there were areas in England such as Essex where geodiversity was receiving inadequate or no focus.

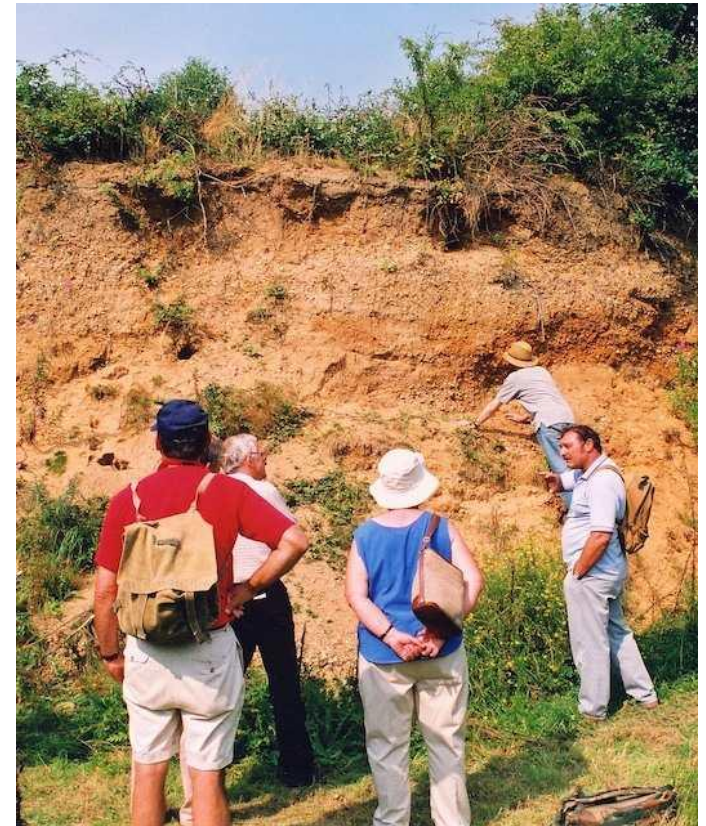
It is taking the lead in developing and co-ordinating the Essex LGAP which covers the administrative county of Essex plus the unitary authorities of Thurrock and Southend. However, the delivery of such an endeavour will require partnership working with many stakeholders, and GeoEssex will therefore encourage the participation of all who can contribute to achievement of the LGAP's objectives.





# Key Objectives of the Essex LGAP

1. **Improve our understanding of the county's geodiversity assets.**
2. **Identify sites of national or local importance so that they can be appropriately managed and conserved. Manage the LoGS citation process.**
3. **Maximise the number of LoGS in favourable condition.**
4. **Ensure that LoGS are recognised and safeguarded in the planning process, similar to biodiversity.**
5. **Raise public awareness, appreciation and understanding of Essex geodiversity.**
6. **Produce educational material suitable for schools and lifelong learning.**
7. **Secure the skills and resources required to execute the Plan. Monitor progress and keep the Plan up to date.**



Gravel laid down by a melting glacier.

Education is a key objective of the Essex LGAP.



## Objective 1 – Understand our Geodiversity Assets

	Targets	Responsibility/Timing
Improve our understanding of the county's geodiversity assets.	Establish an inventory of Essex geological and geomorphological sites , including a brief commentary on their significance and/or importance.	Resp.: GeoEssex Timing: Complete

## Objective 2 – Manage & Conserve our Geodiversity Assets

Objective	Targets	Responsibility/Timing
<p>Identify sites of national or local importance so that they can be appropriately managed and conserved.</p>	<p>1. Establish a condensed list of the criteria by which potential sites of local geological importance - LoGS (Local Geological Sites). will be assessed. N.b. Sites of national importance already designated as SSSIs.</p>	<p>Resp.: GeoEssex and Natural England Timing: Complete</p>
	<p>2. Execute a desktop assessment of all sites in the Essex inventory to identify those likely to qualify as LoGS.</p>	<p>Resp.: GeoEssex Timing: Complete</p>
	<p>3. Identify the high priority sites and conduct a site evaluation vs the LoGS assessment criteria, and recommend formal citation for qualifying sites.</p>	<p>Resp.: Local Authorities, EECOS and GeoEssex Timing: Progressively through 2013</p>
	<p>4. Establish a rolling programme for assessment and citation of lower priority sites.</p>	<p>Resp.: GeoEssex. Timing: To be established once (3) is completed</p>
	<p>5. Agree with stakeholders the forum and process for formal citation of recommended LoGS (prior forum - Essex Wildlife Sites Partnership dissolved).</p>	<p>Resp.: GeoEssex Timing: Q1 2013</p>

## Objective 3 – LoGS Management

Objective	Targets	Responsibility/Timing
<p>Maximise the number of LoGS in favourable condition</p>	<p>1. Assess the current condition of LoGS.</p>	<p>Resp.: GeoEssex in partnership with the site owner.</p> <p>Timing: As resources are available</p>
	<p>2. Identify the actions required to secure favourable condition where appropriate.</p>	
	<p>3. Develop and implement management plans to achieve/maintain favourable condition.</p>	

## Objective 4 – LoGS in the Planning Process

Objective	Targets	Responsibility/Timing
<p>Ensure that geodiversity is recognised and safeguarded in the planning process, similar to biodiversity</p>	<p>1. Assist local authorities with their development of criteria based policies for evaluating developments on or affecting geodiversity sites or landscape areas, in line with <i>The National Policy Planning Framework</i>.</p>	<p>Resp.: GeoEssex in partnership with ECC and Planning activities of local authorities. Timing: 2013</p>
	<p>2. Ensure that LoGS are recognised in county and local strategies, plans and policies, and specifically in LA Local Development Frameworks.</p>	<p>Resp.: GeoEssex and L.A. Planning Activities Timing: Incorporate at the earliest revision of these documents</p>
	<p>3. Provide geodiversity information to planning authorities in a format that allows easy review of the impact of planning applications.</p>	<p>Resp.: GeoEssex Timing: Following LoGS citation</p>
	<p>4. Work with planning authorities to safeguard designated sites, including reviewing relevant planning applications for their impact on geodiversity.</p>	<p>Resp.: GeoEssex Timing: Ongoing</p>

## Objective 5 – Communication of Geodiversity

Objective	Targets	Responsibility/Timing
<p>Raise public awareness, appreciation and understanding of Essex geodiversity</p>	<p>1. Establish an Essex geodiversity website under the aegis of GeoEssex, to publicise the county’s geodiversity resource.</p>	<p>Resp.: GeoEssex Timing: January 2013</p>
	<p>2. Publish the Essex LGAP on this website.</p>	<p>Resp.: GeoEssex. Timing: Q1 2013</p>
	<p>3. Provide a reference CD on Essex geodiversity to all public libraries within the LGAP boundaries, for public use.</p>	<p>Resp.: GeoEssex Timing: Q1 2013</p>
	<p>4. Organise public events such as guided walks, talks, special events (including in co-operation with local museums) to promote interest in our geodiversity and the public understanding of related issues such as climate and sea level change, that feature so prominently in our local geology.</p>	<p>Resp.: GeoEssex Timing: Ongoing</p>
	<p>5. Produce material such as self guided trail leaflets, onsite interpretation, leaflets on key themes and features. Make these available on the website where appropriate.</p>	<p>Resp.: GeoEssex Timing: Define in the workplan for each calendar year.</p>



## Objective 6 – Geodiversity and Education

Objective	Targets	Responsibility/Timing
<p>Produce educational material suitable for schools and lifelong learning.</p>	<p>1. Identify Essex geodiversity sites, features and themes that are relevant to the school science curriculum, and especially Key Stages 1 to 4.</p>	<p>Resp.: GeoEssex with education partners Timing: Define in annual workplan</p>
	<p>2. Work with science teachers to understand what they require to improve delivery of the geodiversity component in current curricula. Consider a Geology Outreach service to take geodiversity into schools.</p>	
	<p>3. In partnership with interested educators produce and disseminate to schools material that will assist teachers to include geodiversity examples and themes in their lesson plans, recognising that many have little or no specific geological knowledge or training. Support interested teachers by providing advice and practical help when required.</p>	
	<p>4. Encourage and support geodiversity in the activities of such groups as WEA and U3A, through talks and making available information on themes of interest.</p>	<p>Resp.: GeoEssex Timing: Define in annual workplan</p>

## Objective 7 – Plan Execution

Objective	Targets	Responsibility/Timing
<p>Secure the skills and resources required to execute the Plan.</p>	<p>1. Assess what skills are required vs those available and seek to make good any shortfalls. Specific skills/knowledge already identified are: relevant scientific knowledge, planning policies and procedures, website design and maintenance, fundraising, site conservation incl. Health &amp; Safety and biodiversity implications, knowledge of the requirements of the school science curriculum, industrial heritage knowledge and communication.</p>	<p>Resp.: GeoEssex Timing: Following agreement of the Plan</p>
<p>Monitor progress and keep the plan up to date</p>	<p>2. Agree an annual workplan for each calendar year. Monitor progress vs the plan every six months and update the plan as required, once a year.</p>	<p>Resp.: GeoEssex Timing: Once or twice a year as appropriate</p>

## A Message from the GeoEssex Team

This document will be hosted on the GeoEssex website due to go live by end March 2013 at the following address: [www.geoessex.org.uk](http://www.geoessex.org.uk) and future updates, together with annual work plans, will appear on that site.

The Team welcomes comments on the Plan and particularly offers of assistance in its delivery. If you are able to help please let us know via the “Contact us” link on the above website.

M. Sandison  
Chairman  
GeoEssex

March 2013

## ATTACHMENT 1 – Geological SSSIs in Essex

District	Nearest town	Name of SSSI
Chelmsford	Great Leighs	River Ter SSSI
Chelmsford	Newney Green	Newney Green Pit SSSI
Colchester	East Mersea	Coopers Beach ('Restaurant Site') (part of Colne Estuary SSSI)
Colchester	East Mersea	Cudmore Grove Cliffs and Foreshore (part of Colne Estuary SSSI)
Colchester	Marks Tey	Marks Tey Brick Pit SSSI
Colchester	Wivenhoe	Wivenhoe Gravel Pit SSSI
Maldon	Althorne	The Cliff SSSI
Maldon	Bradwell	Dengie Marsh (includes Sales Point Cockle Spit) (part of Dengie SSSI)
Maldon	Maldon	Lofts Farm Pit SSSI
Maldon	Maldon	Maldon Cutting SSSI
Maldon	Maylandsea	Maylandsea Foreshore (part of the Blackwater Estuary SSSI)
Maldon	Southminster	Goldsands Road Pit SSSI
Rochford	Foulness	Foulness Island shell banks (part of Foulness SSSI)
Tendring	Ardleigh	Ardleigh Gravel Pit SSSI (Martells Quarry)
Tendring	Clacton	Clacton Cliffs (part of Clacton Cliffs and Foreshore SSSI)
Tendring	Harwich	Harwich Foreshore SSSI
Tendring	Holland-on-Sea	Holland-on-Sea Cliff SSSI
Tendring	Jaywick	Clacton Golf Course (part of Clacton Cliffs and Foreshore SSSI)
Tendring	Jaywick	Jaywick Foreshore (part of Clacton Cliffs and Foreshore SSSI)
Tendring	Little Oakley	Little Oakley Channel SSSI
Tendring	St. Osyth	Colne Point Shingle Spit (part of Colne Estuary SSSI)
Tendring	St. Osyth	St. Osyth Gravel Pit SSSI
Tendring	St. Osyth	St. Osyth Marsh (part of Colne Estuary SSSI)
Tendring	Walton-on-the-Naze	The Naze SSSI
Tendring	Wrabness	Wrabness London Clay Cliffs and Foreshore (part of Stour Estuary SSSI)
Thurrock	Aveley	Purfleet Road SSSI (A13 road cutting)
Thurrock	Chafford Hundred	Lion Pit Tramway Cutting (known as Lion Pit SSSI)
Thurrock	Grays	Globe Pit SSSI
Thurrock	Purfleet	Purfleet Chalk Pits SSSI

Uttlesford	Ugley	Hall's Quarry SSSI (also known as Ugley Park Quarry)
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