

Cambridgeshire's Geology and Landscape

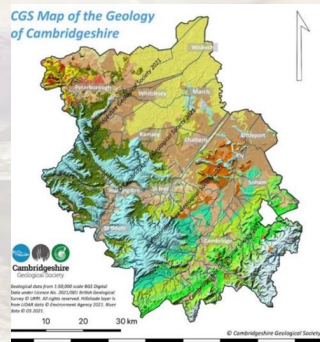
Bedrock: The surface bedrock of Cambridgeshire and Peterborough consists of sedimentary rocks including several different types of mudstones (**clays**), hard and soft **limestones** (including chalk) and **sandstones**. They were formed during the **Jurassic and Cretaceous** Periods between c.180 to c.89 million years ago, with the older (Jurassic) rocks in the north west of the county and the younger (Cretaceous) rocks in the south east. Some of the limestones and sandstones are well-known for their use as building stones (including **Barnack 'Rag'** limestone) whilst some of the clays are famous for brickmaking (particularly the **Oxford Clay** and clay of the **Gault** Formation). The southern part of the county was also known for its 'coprolite' industry that exploited the phosphatic nodules found in the **Cambridge Greensand** and associated rocks. Some local rocks are particularly valuable for their fossils including those of large Jurassic marine reptiles found in the **Oxford and Kimmeridge Clays**.

Superficial (Drift) geology: Overlying the bedrock in many areas are deposits from the last several thousand (c.500,000) years (the **Quaternary** Period), the older dating to the 'Ice Age' (the **Pleistocene**) and the younger to the c.12 thousand years since it ended (the **Holocene**). The former include large areas of **River and Glacial Gravels** and **Glacial Till**. The Till, also known as '**Boulder Clay**', includes clay, chalk, flint, sandstone and sand plus large cobbles and boulders ('erratics') of hard, crystalline rock (such as granite and quartzite) with distant origins.

Geomorphology and Landscape: The county has unique, and highly characteristic Earth Heritage values that continue to be revealed as more research is undertaken. The **limestone plateau** in the north west contrasts with the low lying **fen basin** surrounded by clay hills to the south west and high **chalk hills** in the south east. **Three major river valleys** run north east into the fenland.

About Cambridgeshire Geological Society (CGS)

CGS promotes interest in the geology of Cambridgeshire, the UK and worldwide by organising talks, walks, field visits and other events. Their websites www.cambsgeology.org and www.fenedgetrail.org provide information on local landscapes and geology. CGS also identifies geologically valuable sites in the county and liaises with landowners to encourage their geoconservation. CGS works in partnership with GeoPeterborough who identify and monitor LGS in the Peterborough District.



Local Geological Sites (LGS) and Candidate LGS (cLGS) Information for landowners



Examples of current LGS: (top) Orwell Clunch Pit; Great Fen - Holme Fen and Whittlesea Mere; East Pit, Cherry Hinton (cover of LGS leaflet); Nine Wells chalk springs.

Geodiversity and Geoconservation

Geodiversity is the variety of rocks, minerals, fossils, soils and landscapes, together with the natural processes which form them. It provides the key link between **geology, landscape, biodiversity and people**. It is an important **Earth Heritage** resource and it is **essential that it is protected**, through **geoconservation**, for future generations. **Local Geological Site** status is a **non-statutory**, county-based designation recognising a site for its significant **geological or geomorphological (landform) features**. As with Local (County) Wildlife Sites), landowners receive advice on how to conserve its values.

Further information

Cambridgeshire Geological Society (CGS) will be happy to meet with any landowner to discuss the geodiversity value of a site and its beneficial management for geoconservation. Please email us to make contact.

www.cambsgeology.org info@cambsgeology.org

What are Local Geological Sites (LGS)?

Like **County (Local) Wildlife Sites (CWS)**, LGS are 'Local Sites' selected for their value for nature conservation – in this case for their Earth Heritage features. Formerly known as Regionally Important Geological Sites (**RIGS**), the aim of the designation is to improve the management of

the sites and to promote their use for research and education. LGS may be obvious geological sites such as **pits and quarries** that expose the **bedrock** but can also be landscape features such as **springs, ponds, meres and water channels**. Sites that tell the story of the county's geology-linked industrial and economic heritage may



East Pit, Cherry Hinton

also be designated. In Cambridgeshire, this includes **lime and brick kilns, village pits, coprolite diggings** and features that relate to transport, land drainage and the landscape history of the Fens, such as **pumping stations and hythes**.

Significant **climate and sea-level events** over the last 500 thousand years have left particularly important Earth Heritage features in Cambridgeshire, especially in **the Fens**. The deposits lying under the soil include **peats, silts and clays** that form the **background to a rich archaeological heritage**. As well as being of **great economic value**, the **sands and gravels** of the river valleys have provided important archaeological and palaeontological finds. Large boulders (**erratics**) found in the countryside represent the effects of ice on the landscape. LGS may be designated for the presence of these features as they help to tell the story of the landscape or are significant for discoveries of **fossils and environmental indicators**.

It is also possible to designate a building for its **building stones** including the '**exotic**' **cobbles** brought by glaciers and now found across the local countryside. Even a **view** could be designated if it is of landscape significance.



Blocks of Barnack limestone at the Great Fen LGS (Whittlesea Mere)

How are LGS designated?

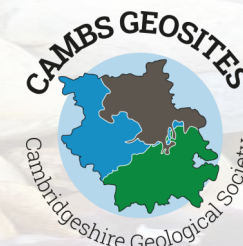
Potential LGS are proposed by the CGS Geosites team based on their Earth Heritage value in telling the story of the geology and landscape of the county. The site is then considered by the county's **Local Sites Panel** made up of representatives of the District Local Authorities, the County Council, Natural England, FWAG and biodiversity and geological conservation organisations such as the Wildlife Trust BCN, GeoPeterborough and CGS. Sites are evaluated in terms of the **scientific, educational, historical and aesthetic landscape value** of their geological and geomorphological (landform) features.

Candidate LGS

As geoconservation in the county has been overlooked in the past, it has been agreed by the Local Sites Panel that the process of identifying and mapping potential LGS should be undertaken as soon as possible.

After initial research, the CGS Geosites team are, therefore, notifying the Local Sites Panel of a list of 'Candidate' LGS (cLGS) and they are then mapped on the county records system held by **Cambridgeshire and Peterborough Environmental Records Centre (CPERC)**. This enables information on sites with geological value to be available to planners and others with responsibility for policy implementation.

The **first 12 Candidate sites** were listed and mapped in October 2021 with further sites added each year, at the twice-yearly Local Sites meetings. The Candidate LGS system was first adopted in Norfolk with a total of c.400 sites mapped (it is unlikely that there will be this many in Cambridgeshire). After further research on the Candidate site and full assessment of its values, CGS contacts the owner ahead of a **proposal for LGS designation** and offers **advice on maintaining the geodiversity value**.



2 Candidate sites at Wicken Fen: Sedge Fen & Reach Lode (since designated as LGS).



What does it mean for me as a landowner or manager?

LGS designation of your site means that you have an **Earth Heritage feature of county (or potentially wider) importance** on your land.

Designation usually involves a **voluntary (and informal) agreement** with the landowner. It does not place any legal obligations on the landowner, **nor confer any right of public access**. Existing public Rights of Way are not affected and **no new footpaths are created**. The **landowner chooses the level of access**: for example, 'open access', 'access by prior notification only', 'for groups', 'for research only'.

Designation **does not restrict agricultural operations nor digging for minerals**; in fact such activities may help provide access to new geological information. However, for any significant change of land use, the planning authorities will take LGS designation into account, along with other planning considerations, e.g. wildlife, archaeology. LGS designation may assist with sourcing of relevant grants.