Burnham Beeches and Stoke Common

Beeches Geology Trail

The Geology Trail starts and finishes at the Beeches Café, taking you out through Egypt and back along the footpaths of Burnham Walk and Victoria Drive. It is about 3 km long and takes about 1½ hours to complete.

This trail is not suitable for wheelchairs or 'stroller' pushchairs, but should be alright for off-road buggies unless it has been raining, when the path becomes muddy and slippery. Boots or stout shoes are advisable whatever the weather.

The landscape of Burnham Beeches - the pollards, the mire, the open grasslands, the ponds - has been created by the way people used the site in the past, and the way it is managed today. Underpinning this, quite literally, are the soils, rocks and minerals that make it possible for this range of habitats to exist.

The type of vegetation that can grow here is determined by, among other things:

- soil type
- drainage

  and
- topography

or, in essence, by the site's geology.

Burnham Beeches is a National Nature Reserve, Site of Special Scientific Interest and European Special Area of Conservation; Stoke Common is a Site of Special Scientific Interest. They are owned and managed by the City of London.

www.cityoflondon.gov.uk/burnhambeeches

Exploring Burnham Beeches

Burnham Beeches is a National Nature Reserve and Special Area of Conservation.

Please follow the Country Code and ensure that all gates are closed behind you. Please take your litter home with you and leave all plants and fungi for everyone to enjoy.

Well behaved dogs are welcome, but they must be under effective control at all times and on a lead where requested. Please clear up after your dog and use the dog bins provided.

Livestock graze much of the nature reserve to help look after it. Please do not feed, or try to stroke them.

Adult cyclists and horse riders are only allowed on the tarmac roads. All the other paths are for people on foot and young children learning to ride bikes.

Facilities: toilets, an information point and café are at Victory Cross, near the main car park. A tramper is available free of charge from the Burnham Beeches office so that less mobile visitors may explore the Beeches; this service is only available during the week at present - please ring for more information.

Want to know more?

Our website has more information about the sites, copies of the management plans, details of volunteer tasks and events, trails and up-to-date news. You can also contact the Rangers at the Burnham Beeches Office (weekdays) on 01753 647358.

Finished with this fact sheet?

If you would like to know more about how land management has created the habitats that make the Beeches so special, you could also download our fact sheets about pollards, wood pasture and heathland.

Registered charity, no. 232987

1 Top of Winter Hill Gravel Terrace
Main Common

The trail starts at the Beeches Café on the Main Common.

The gravels underfoot are Quaternary in age (Anglian Stage) and were deposited about 450,000 to 500,000 years ago in a fast-flowing braided river system carrying glacial meltwaters in the ancestral Thames.

Walk approximately 200m from the café east along Lord Mayors Drive, towards the reserve entrance.

2 *Turn left (north) off Lord Mayor's Drive by the litter bin at the edge of a small grassy area and follow the footpath into the woods.*

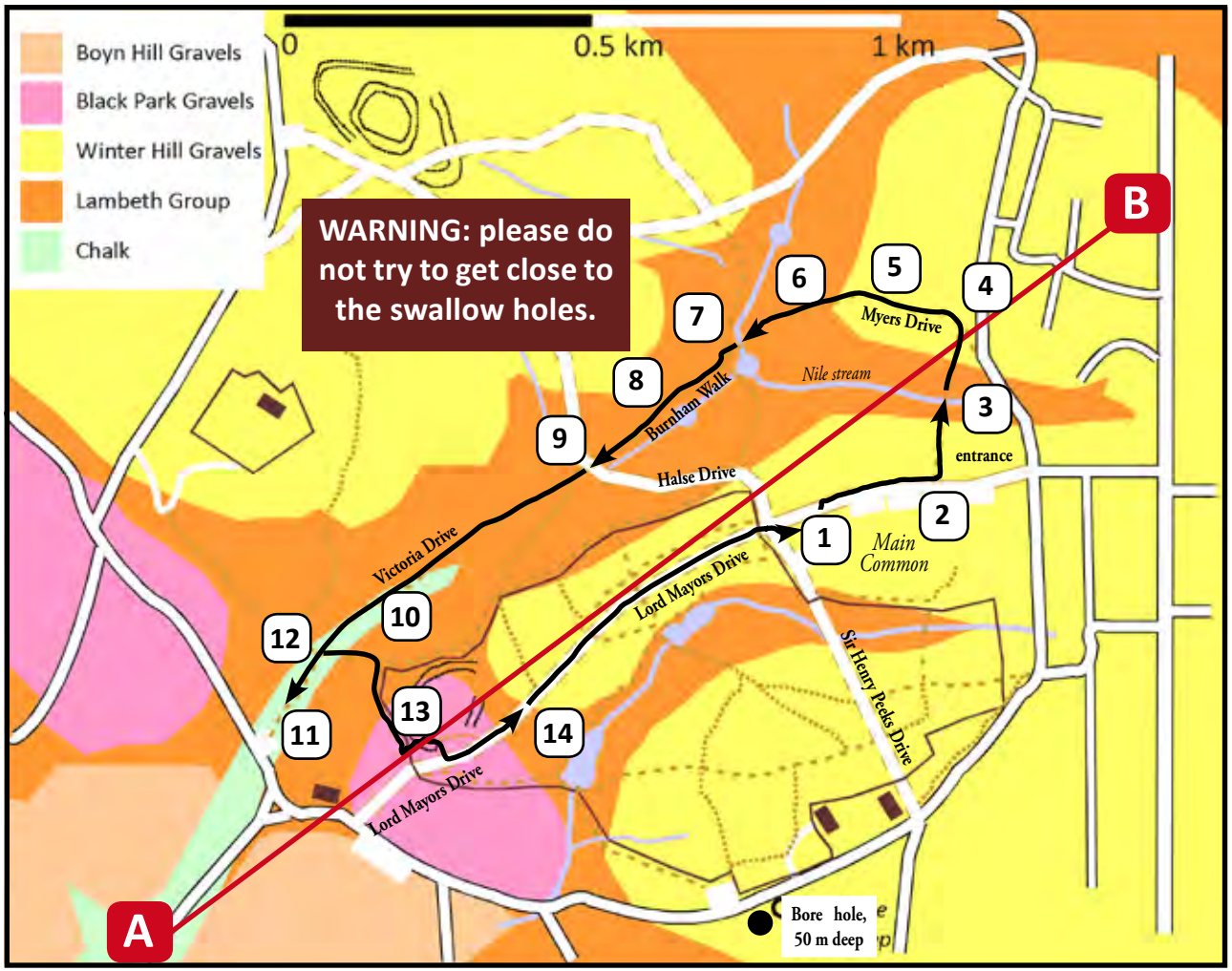
3 Lambeth Group: Sand and Clays
Bridge over Nile stream

The stream has cut deeply into the valley bottom and occasionally exposes the sand and clays of the Reading formation, part of the Lambeth Group. *For futher information see the stratigraphic chart at www.bucksgeology.org.uk/tertiary.html*

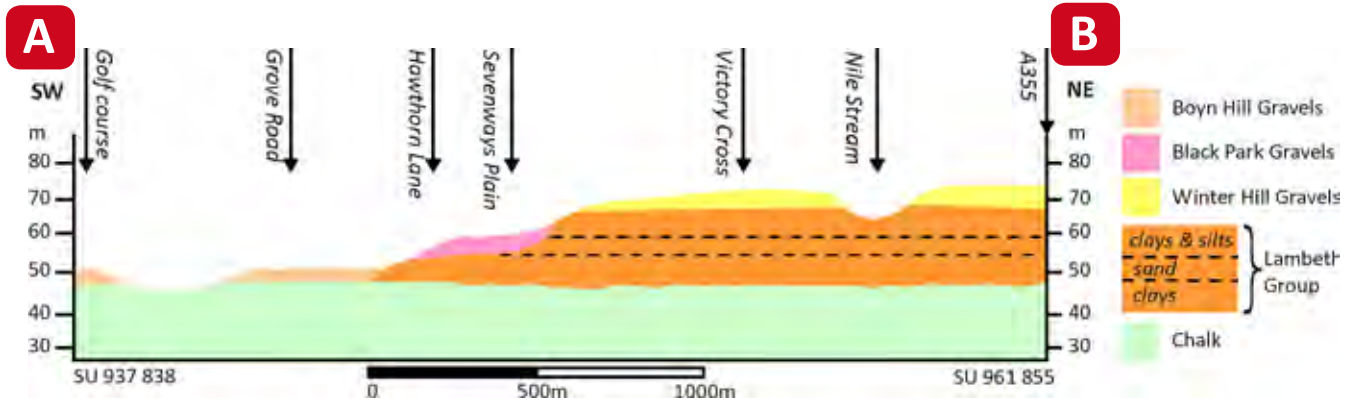
The clays can be bluish-grey and brown-red often with a mottled apearance. These sediments were laid down during the Palaeogene (54 - 56 million years ago) under a variety of shallow marine, coastal and fluvial environments.

Springs can occur where the sands and under-lying clays meet, they appear as boggy areas next to the path. The mixed nature of the sands, silts and clays within the Lambeth Group can cause small patches where the water table is higher than in the surrounding area.

Cross the footbridge over the Nile stream and follow the path straight ahead and up the incline.



If we could cut an 80m vertical slice through the Beeches along the red line we would see these rocks.



*Turn left at the top of the slope and follow the path on the left (**Myers Drive**) heading west.*

5 Winter Hill Gravel Terrace
Myers Drive

The Winter Hill Gravels are (when freshly exposed) a reddish-orange colour, with an abundance of coarse sand and silts. However, when weathered they become bleached and sands are washed away leaving the more obvious larger pebbles behind. The pebbles are mainly flint, quartz, quartzites and occasional greensand cherts. They come from far beyond the district, for example, the quartz and quartzites are from the Midlands.

6 Lambeth Group / Winter Hill boundary
Myers Drive

As the path curves down to the left (after the bench on the right) the gravels are again exposed. Try and decide where the boundary between the Winter Hill Gravels and underlying clays of the Lambeth Group are, based on the exposures in the path.

7 Swallow Holes
Myers Drive / Burnham Walk

The Nile stream ends at a large swallow hole that can be seen from the junction of Myers Drive and Burnham Walk.

A swallow hole forms where the chalk below the surface is naturally dissolved by circulating water. Spaces develop underground leading to local collapse. Swallow holes (also known as sink holes) often have streams flowing into them.

*Take the **second left** at the junction and continue southwest, along **Burnham Walk** (unsigned).*

8 Loess Soils / Dry Valley
Burnham Walk

From here on the valley becomes dry and the Chalk is close to the surface. There are light brownish-yellow loess soils. They are much richer in nutrients than the sandy gravel soils in other parts of the Beeches.

Loess is a geological term that refers to deposits of silts that have been laid down by wind action in the ice age.

Cross Halse Drive (tarmac) onto Victoria Drive.

9 Imported Stones
Burnham Walk - Victoria Drive

Be careful not to read too much geology in the path below your feet! Burnham Walk and Victoria Drive were surfaced with rubble from the London Blitz, brought here when the site was under the control of the Ministry of Defence (1942 - 1947) and used as a vehicle storage and preparation depot.

The grey road stone immediately at the junction of Halse Drive and Victoria Drive is of limestone used to surface a former car park.

10 Disused Brick Workings
Victoria Drive

The hollows and dips on the south side of Victoria Drive show the site was extensively quarried. Brick kilns are shown on old maps to the south of this site; Kiln Farm and Kiln Woods are nearby.

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Look for what was probably a large brick pit, 200 m before the parking area. The Black Park Gravel terrace outcrops at the back of this disused quarry. Lambeth Group sediments, found below gravels, appear to be clays/silts which were probably extracted to make bricks.

Fragments of Chalk rock can be found among the clay on the quarry floor, suggesting that the extraction of material from the Lambeth Group extended down to the Chalk layer.

*There is also a working quarry at the Beeches which provides gravel for work on the reserve. In 2010 this gained **Local Geological Site status**. For safety reasons, the quarry is closed to the public.*

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Now retrace your steps a few metres back along Victoria Drive and take the steep footpath up the slope on your right (south).

Turn right at the wooden fence at the top and follow the path alongside until you reach a gate on your left, just before Lord Mayor's Drive. Go through the gate onto Sevenways Plain.

13 Iron Age Hill Fort
Sevenways Plain

In the late Bronze Age and Early Iron Age (8th - 5th centuries BC) this was a hill fort, built on the flat ground provided by the Black Park Gravels. A wide ditch encircles the fort, measuring about 140m north to south by 100m east to west.

Follow the footpaths, bearing right until you rejoin the tarmac road of Lord Mayor's Drive.

14 Remnant River Terrace
Lord Mayors Drive

As you walk up Lord Mayors Drive back towards the Beeches Café, note the small rise from the younger Black Park Gravels to the older Winter Hill Gravels.

Stay on the road and the Café is on your right.

There haven't always been trees at Burnham Beeches

A Tropical Sea

85 million years ago, during the Upper Cretaceous period, most of Britain was underwater. The climate was much warmer than today and sea level is believed to have been up to 250m higher.

Chalk, formed from the skeletons of tiny sea creatures, is the oldest rock to be found at the surface at Burnham Beeches.

A Tropical Estuary

At the end of the Cretaceous period the sea level fell and the upper parts of the chalk were eroded away.

What is now Burnham Beeches lay to the west of an open ocean. It was part of a delta estuary where muddy rivers deposited clays, silts and sands of the Reading Formation (part of the Lambeth Group) on top of the remaining chalk.

An Ice Age River

During the last Ice Age the Thames was a braided river system.

Seasonal meltwater from the glaciers would produce torrential flow that would then dry to leave braided trickles - many small channels of water.

The river water deposited sands and gravels on top of the clay and silt from the estuary. These have been preserved as old river terraces. Some of the pebbles found here originate from as far away as the Midlands and even France.

Look for these pebbles at Burnham Beeches

Originating in the chalk, **flint pebbles** are the most common pebbles at the Beeches. They are multi-coloured, and can be black, grey, yellow, white and brown.

Flint is made from silica, like glass; when these pebbles break they have sharp edges and rippling, "shell-like" fractures.

The distinctive **quartzite pebbles** are very hard, dense and smooth and usually a uniform reddish brown. They were originally sandstone (a sedimentary rock) but have undergone mild metamorphism due to heat and pressure. If broken, individual sand grains can be made out on the broken surfaces.

They are sometimes called 'Bunter' pebbles, which refers to the Bunter Sandstone Formation from which they were derived.

A small number of pebbles are milky white or cream coloured. These **vein quartz pebbles** orginated as crystalline sheet-like intrusions into older rocks associated with hydrothermal or intrusive igneous activity. They are probably one of the oldest rocks you can find within the gravels.

The Geology Trail was devised by Graham Hickman of the Bucks Earth Heritage Group. The Group runs events including talks, workshops, indoor fun days such as the Rock and Fossil Roadshow, guided walks and quarry visits. For more information about these, or geology in general, visit **www.bucksgeology.org.uk**

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